via inmarsat

THE WORLD OF MOBILE SATELLITE COMMUNICATION

JANUARY 1999

FLIGHT TO FREEDOM

The Internet watches as Keiko the killer whale is flown home

LONG HAUL

European integration ushers in a new era of fleet management

BUSH TELEGRAPH

REACHING OUT TO TANZANIA'S GAME RESERVES

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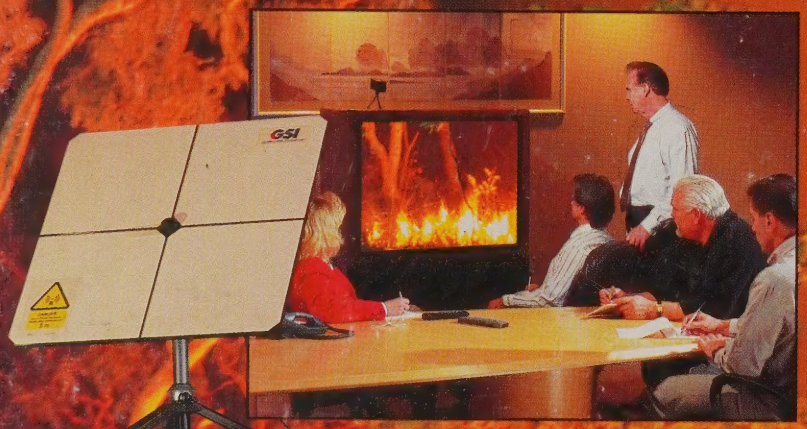

GLOBAL VIEW

It's difficult to know exactly how many people are currently using the Internet. The figures I've seen range from 20 million to 250 million. But one thing I think just about everyone is agreed upon is that the Internet is continuing to grow at a phenomenal rate.

It was 30 years ago this year, while Neil Armstrong was walking on the moon, that the US Defense Department set up the precursor to the Internet, called Arpanet, to connect the computers at four different locations.

As the Internet has grown, so has the number of tools at our disposal. The first, introduced for the Arpanet, were file transfers (FTP) and remote access to computers (Telnet). Then in 1972 came electronic mail, now probably the most popular application, followed by 'bulletin boards', gopher sites, and in 1992 the now ubiquitous World-Wide Web.

It's a little harder to see where the Internet is going from here, but looking through this issue of *Via Inmarsat* magazine I think I can see a few pointers.

In Newsline, there is a report on how the Around Alone yachtsmen are using mini-M to beam photos and give phone interviews for the race website, while in the feature on Keiko the killer whale, this is taken a stage further with video and audio coverage of the movie mammal's flight to freedom – 'webcast' to the world via Inmarsat-B.

In the Innovations section, we read how the Web is spawning a new generation of fleet tracking applications, enabling the exact location of ships or trucks to be monitored on global maps.

And in Talking Shop, Telstra's launch of free access to the Net and IMC's 'Internet tunnelling' service hold out the prospect of more cost-effective ship-to-shore communication and vessel management.

Yet, to my mind, the most intriguing has to be the story of the *RelationShip*, an unmanned trimaran being sailed around the globe remotely, via Inmarsat, from a university in Germany. The voyage, of course, can be followed by us all on the Web.

The implications of the birth of the Internet 30 years ago are only really just beginning to emerge. Inmarsat, however, is already playing a major part in building its future

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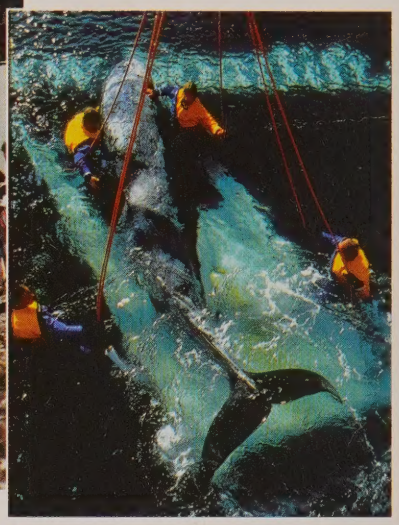
COVER PHOTOGRAPH: TONY STONE

CONT

● WHEN THE WIND BLOWS: Hurricane Mitch hits Honduras and Nicaragua SEE PAGE 8



● WHALE WINCH: Keiko the killer whale is flown home SEE PAGE 12

PHOTOGRAPHS: TONY STONE, TOM ORDWAY/THE FREE WILLY KEIKO FOUNDATION

NEWS

NEWSLINK 6
The latest information on Inmarsat's world of satcoms.

● COCKPIT COMFORT: Boeing business jets come in to land SEE PAGE 16

FEATURES

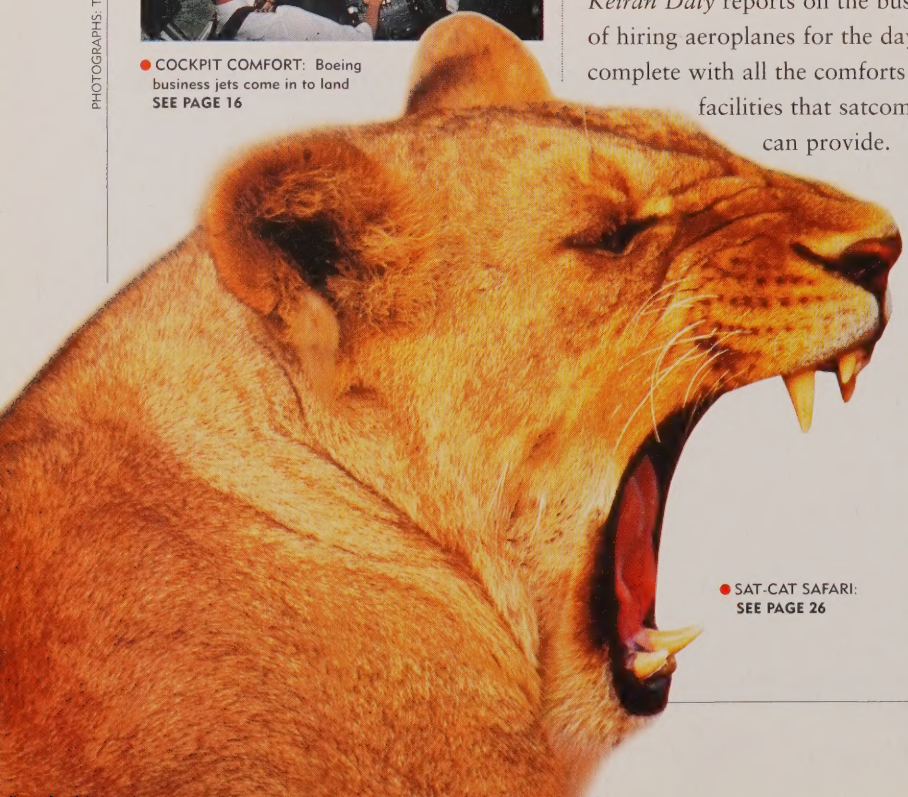
FLIGHT TO FREEDOM 12
Keiko the whale, star of the movie *Free Willy*, was flown thousands of kilometres to his new home. *Jack Craze* explains how the world was able to watch on the Internet

NET BENEFITS 16
Keiran Daly reports on the business of hiring aeroplanes for the day, complete with all the comforts and facilities that satcoms can provide.

GHOST SHIP 20
Somewhere on the high seas there's an extraordinary vessel making an epic journey. As *Andrew Ingle* reports, its crew are long gone.

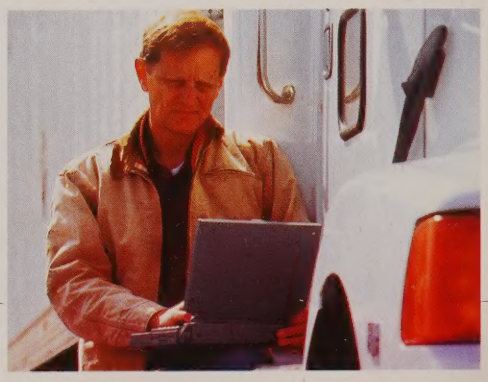
BUSH TELEGRAPH 26
Tanzania's remarkable Ngorongoro Crater is one of the most exhilarating safari haunts in Africa. *Sue Kernaghan* tells how Inmarsat is playing an increasingly important role in its management.

THE LONG HAUL 30
Patrick Hook explains how the European haulage industry is changing, aided all the way by satellite tracking.



● SAT-CAT SAFARI: SEE PAGE 26

● LORRY LAPTOP: Long-haul satellite trackers in action SEE PAGE 30



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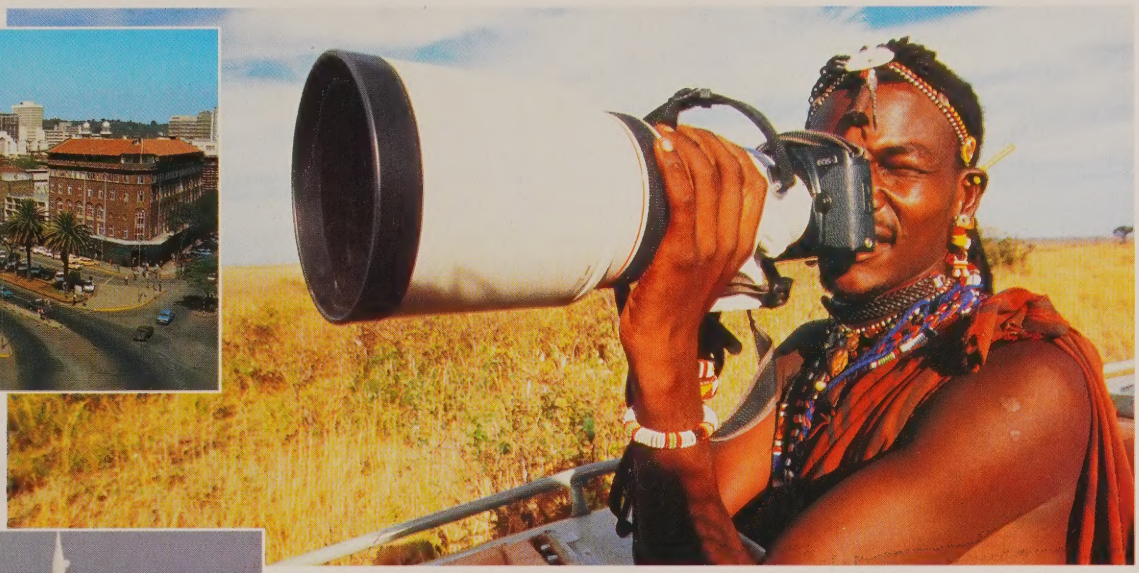


● NAIROBI IN FOCUS: The business and culture capital of East Africa SEE PAGE 35

PHOTOGRAPHS: TONY STONE, ROBERT HARDING, SYGMA

● PLAIN SAILING: Board a crewless trimaran via the Internet SEE PAGE 20

FACE TO FACE: GILL GOVIER 32

The millennium bug could cause all kinds of damage come the turn of the century. Gill Govier is aiming to make sure that the telecommunications industry is ready.

HOT SPOT: NAIROBI 35

Your guide to satcom requirements and information in the business capital of East Africa.

REGULAR FEATURES

INNOVATIONS

RIGHT ON TRACK 40

Freight companies are discovering the value of webtracking: following the fleet via the Internet. *Patrick Hook* hitches a lift.

TALKING SHOP

PRODUCTS & SERVICES 42

The latest information on Inmarsat's global partners, their products and service innovations.

LAST WORD

IN CONVOY 50

Andrew Thomas, deputy editor of the *International Herald Tribune*, reports on his convoy journey through China.

● THE FREIGHT LINE: Cargo surveillance on the Net SEE PAGE 40

● ON THE ROAD: The Kunming convoy relayed via Inmarsat SEE PAGE 50

Elbow sea surgery aided by Comsat

PHOTOGRAPH: KOS PICTURES

● LONE LISTING: Combating the perils and isolation of the Around Alone race

The solitary sailors battling for supremacy in the Around Alone single-handed yacht race put safety above personal glory when they agreed to change course collectively to avoid a heavy storm brewing in the notorious Southern Ocean. With bad weather brewing ahead in the second leg of the Comsat-sponsored around-the-world race, France's Isabelle Autissier – the only female competitor – and Italy's Giovanni Soldini, agreed by Inmarsat e-mail to propose setting a new, unofficial way-point north of the Kerguelen islands.

The pair then contacted the other competitors and race organizers over their Trimble Galaxy Inmarsat-C terminals, and in an unprecedented display of communication and co-operation convinced them of the need to change course.

In an e-mail response to the skippers, race director Mark Schrader said: "I agree with your decision and want to congratulate all of you for working together to avoid unnecessary risks. I'm very proud of you all for putting the interest of your own safety and the safety of others ahead of anything else. The spirit of the event is alive and well."

The Southern Ocean leg from Cape Town, South Africa, to Auckland, New Zealand, is probably the most testing on the 43,000km, Around Alone race. Leg three gets under way on February 6, with the final stretch from Punta del Este, Uruguay, back to Charleston, South Carolina, starting on April 10.

During the first leg from Charleston to Cape Town, Inmarsat-C also came to the aid of Russian skipper Viktor Yazykov, who successfully performed surgery on an abscessed elbow under the supervision of Dr Dan Carlin of the World Clinic in Boston, who relayed step-by-step instructions via the Comsat-C e-mail service.

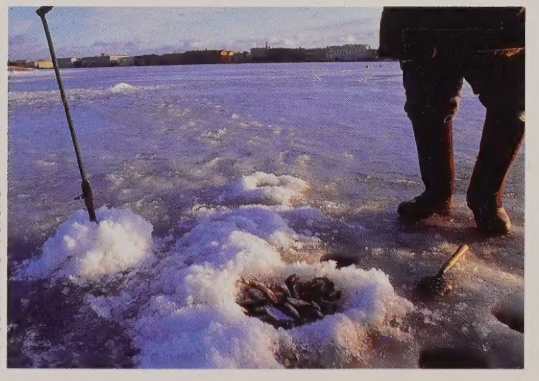
Comsat-C is the mainstay and centrepiece of the communications network for the race's 16 competitors, enabling them to send and receive text messages, data and Internet e-mail and to transmit regular position reports back to race HQ.

The skippers are also using KVH Tracphone 25 mini-M phones to send regular multimedia reports of their progress back to the Around Alone website, including photographs and audio interviews played on the Web over the RealPlayer software from RealNetworks.

Surf to: www.aroundalone.com

FOLLOW THE FLEET

Two hundred ships that ply their trade along the great Siberian rivers are being fitted with Inmarsat-C terminals to improve communication and tracking through Russia's remote industrial hinterlands. Owned by the Upper Lena River Shipping Company, the ships are the only viable means of servicing and supplying the isolated industries, such as mining and logging, located along these arterial waterways. The maritime Thrane & Thrane Inmarsat-C terminals are being supplied as part of a deal with Russian service provider Morsviazsputnik. Full operational service, including a FleetNet management, control and tracking system, plus digital maps and logistics developed by Morsviazsputnik, is due to begin early this year.



PHOTOGRAPH: TONY STONE

● COLD FLOW: The Russian rivers

The shipping company, which will now restructure its communication and management systems along the Siberian rivers, chose Inmarsat as an alternative to HF radio after a lengthy economic feasibility study.

Sergey Ivchenko, director general of the Upper Lena River Shipping Company, said: "We can now maintain reliable communication with any ship up to 80 degrees North and know her exact position. We can also broadcast information and receive distress alerts, thereby improving the safety of navigation on the great Siberian rivers."

Contact Morsviazsputnik at root@marsat.glasnet.ru

WALK ON THE WILD SIDE

An international wildlife film crew trapped by the weather on a snow-bound Arctic island have revealed how their mini-M phone helped save their lives.

Australian cameraman Roy McGuiness, Japanese producer Tatsuiko Kobayashi and Russian wildlife expert Nikita Ovsyannikov were prevented from making their scheduled departure when winter arrived early at Wrangel Island, 320 kilometres off the north-east coast of Russia.

High winds and blizzards grounded possible rescue flights and an attempt to reach them by snow-mobile was abandoned because shifting ice made it too dangerous to cross the sea from the mainland. Food was short and they were reduced to one meal a day, as the polar bears they had come to film scratched hungrily at the windows of their hut. With daylight shrinking to barely three hours a day and temperatures outside dropping to below -30 degrees C, their Thrane and Thrane mini-M became their only link with the outside world. Keeping the phone powered up was vital.

Initially, the crew used a Honda generator they'd brought with them to charge the batteries. When one of the latter failed, they rigged up a video camera battery to keep the phone going. But the final *coup de grace* was finding a primitive accumulator – similar to an old car battery – stowed away in their hut. The three men were able to charge the accumulator from the Honda generator and connect it to the mini-M by a special cable, included with the phone by Inmarsat service provider Morsviazsputnik in case of emergency.

"There on Wrangel Island the satphone saved our lives," said Tatsuhiko Kobayashi. "We got on the air every day for 10 to 15 minutes. We spoke with our families and offices in New Zealand, Australia and Japan. Every day we managed to receive weather reports. We were also in everyday contact with Pevek emergency centre, which was to organize our rescue."

Although the crew talked to their rescuers over the phone, they preferred to use e-mail during their isolation on the island so they could forward large volumes of data and access the Internet – one of the reasons why they chose Inmarsat when planning the expedition.

"We knew that satphones had rarely been used this far north before (71 degrees north), but when they were used they never failed," said Tatsuhiko Kobayashi.

The crew were finally rescued by a Russian helicopter after six weeks, just as their food was running dangerously low. The week before they had run out of meat, leaving them to survive solely on rice, some grain called grechka, beans, sugar and tea.

PHOTOGRAPH: TONY STONE

BEAR BAIT: The film crew were trapped in their cabin with Inmarsat their only link to the world

Ultra marathon model man wins through

International model Nicholas Bourne took gunmen, tropical disease and poisonous snakes in his stride to become the first person to run the length of Africa last month.

The 'ultra' marathon man covered the 10,000km from Cape Town to Cairo in 11 months and got through 30 pairs of trainers during his amazing feat on foot. Even while suffering from a mysterious illness, picked up crossing the Kalahari desert, Nick managed to push on – albeit slowly – towards his goal of raising more than a million dollars for charity.

The British-born model was supported throughout by his Run for Africa expedition team of five, headed by his sister Emma, who followed behind in four all-terrain vehicles equipped with Inmarsat-C and GPS, as well as an Inmarsat mini-M phone. It was with the help of the mini-M and Nick's mother, May Grandy, back home in the UK, that he finally managed to overcome the mystery illness, wrongly diagnosed as malaria, that had beset him since the Kalahari.

The expedition team is continuing to raise funds and is working on a project to build 'Run for Africa' schools throughout Africa.

Surf to:
www.runforafrica.com

HURRICANE MITCH DISASTER RELIEF

● The disaster relief effort that swung into action after Hurricane Mitch laid waste vast areas of Nicaragua and Honduras in November was supported by the donation of four Planet 1 mini-M phones by US service provider Comsat.

● The mini-M phones were used by emergency aid workers belonging to the US-based Adventist Development and Relief Agency (ADRA) in areas devastated and cut off by the torrential floods that followed the hurricane.

● "The scope of Hurricane Mitch, the greatest disaster in our hemisphere in 200 years, is so extensive that there are virtually no communications services available for our in-country staff," Ralph Watts, president of ADRA, said shortly after relief work began.

● "Comsat's contribution of four satellite phones now makes it possible for ADRA to facilitate and direct the co-ordination of its humanitarian response in Honduras and Nicaragua. These satellite phones will help us save many survivors who have been isolated by the storm's destruction of the country's communications systems."

● Hurricane Mitch was responsible for the deaths of thousands of people. The destruction of housing, agriculture, and infrastructure was on an unprecedented scale, with highways, roads, bridges, electricity, water and sewage, and communications systems all severely damaged.

● It is estimated that 80 per cent of the basic food crops were affected.

MITCH MET FACTS

■ Hurricane Mitch ranks as one of the fiercest Atlantic hurricanes ever recorded. Ripping through Honduras and Nicaragua, Mitch brought flooding and wreckage on a devastating scale, causing widespread damage and loss of life as it made landfall and moved through the region.

■ Like most Atlantic Ocean hurricanes, Mitch began life as a small weather disturbance over western Africa. This disturbance, known as a tropical wave, journeyed westward from its point of origin, gathering cloud around it as it began to turn and swell. North of Colombia in the Southern Caribbean Sea, and rotating now in an anti-clockwise direction, this cloud mass became a tropical depression (October 22) and then, as the winds at its core came to exceed 63kph, a fully fledged tropical storm.

■ Mitch was officially declared a Hurricane as on October 24 its winds reached 120kph. However, by the time it turned south and hit the northern coast of Honduras, Mitch had abated somewhat. Most of the damage caused actually came from the vast amount of rainfall brought by the storm, surviving records indicating rainfall totals in southern Honduras of 63 centimetres in 36 hours and 25 centimetres in 6 hours between October 29 and 31.

■ On November 1 Mitch began to weaken and dissipate over Guatemala before reforming out at sea and moving on towards the coast of southern Florida. Its passage has left an entire region ravaged and in turmoil.

PHOTOGRAPH: SYGMA ILLUSTRATION: FRED VAN DEELEN

SOFT LANDING

■ The entire set of Inmarsat navigation services was demonstrated for the first time when a BAC-111 plane carried out a precision airport approach followed by a Category 1 landing at the UK's Farnborough Airshow recently. Maneouvres were made with the help of a signal from the Northern European Satellite Testbed (Nestbed), an experimental navigation system which itself makes use of a signal from the navigation payload on the Inmarsat-3 F5 satellite.

■ Set up by the UK National Air Traffic Services (NATS), Nestbed is a project to demonstrate the Satellite-Based Augmentation System (SBAS) concept. As well as NATS, it involves Racal Avionics, Racal Research, BT and Inmarsat.

PHOTOGRAPH: AUSTIN J. BROWN

■ SBAS will provide a quality of positioning information never before available to the aviation community. It will improve GPS accuracy to about seven metres vertically and horizontally, improve system availability and provide important integrity information about the entire GPS constellation.

■ "Nestbed will make it possible to use GPS as a primary means of navigation as well as for basic Category 1 approaches to selected airports," said Oleg Razumovsky, navigation engineer at Inmarsat. "We are proud that Inmarsat is playing an important role in this project."

SEA SCHOOL

A British couple and their two teenage daughters have embarked on a 24,135km journey across the globe in a 56-foot yacht built in their own back garden. The girls, aged 13 and 16, are following a full course of study, connecting to lessons at a UK school and sending their assignments over the Internet via Inmarsat.

On the first leg of the trip, from Plymouth, UK, to The Gambia, the Edington family is delivering vital aid to charitable projects run by Sight Savers International, including artificial lenses for two eye-surgery camps where waiting doctors will carry out over 200 sight-restoring operations. As part of the project, the girls' school, Cranford Community School in Hounslow, west London, will use information from the voyage to teach their fellow pupils, with photos and text beamed to an educational website.

The Edington's yacht is equipped with Inmarsat-C and GPS, as well as a mini-M phone. The 14-month journey will take them across the Caribbean, through the Panama Canal, and on to the South Pacific to deliver aid for islands in the region. "We are very excited about the adventure. The Inmarsat link will not only add immeasurably to the safety of the trip, but will make it possible for the girls to continue with their studies as well as contribute to the education of thousands of other schoolchildren," said Peter Edington.

Surf to: www.eduweb.co.uk, www.sightsail.co.uk

EXTENDED ADS

Automatic Dependent Surveillance (ADS) for passenger aircraft is due to be extended to the North Atlantic this March. With ADS, aircraft regularly and automatically report their position and other essential flight data to air traffic controllers, who can then monitor their flightpaths even when outside radar range. As a result, airlines will be able to fly more fuel-efficient and cost-effective routes.

- Already operating successfully in the South Pacific using Inmarsat Aero services, ADS is a key element in the Future Air Navigation System (FANS) for the management of air traffic world-wide beyond the year 2000.

CANADA SIGN UP

Canadian Airlines International became the first customer for the new Inmarsat Aero-H+ service when it commissioned the satcoms on the first of four new Boeing 747-400 aircraft.

- Aero-H+ exploits the extra power of the Inmarsat-3 spot-beams, plus new 4.8kbps voice codecs, to offer more robust multichannel and edge-of-coverage performance, as well as improved operational costs.
- The service also works within the satellites' global beams, so that aircraft can use voice, fax and data satcoms anywhere within world-wide Inmarsat coverage.
- Aero-H+ is an evolution of the established and hugely successful Aero-H service, which is used on more than 70 per cent of the world's long-haul airliners. Canadian Airlines will be operating the Boeing 747s from its Vancouver base on long-haul routes to the Far East and Europe, and will also be installing Inmarsat Aero on its 11 B767 aircraft.

MINISAT TO THE RESCUE

■ The life of a Papuan chief's son was saved by Australian army peace monitors using Inmarsat telemedicine when the young man accidentally fell into a campfire.

■ Until then, the peace monitors from the Australian army's 110 signal squadron were viewed with suspicion by locals. But the incident heralded a major turning point in their relations with the people of Bougainville, part of Papua New Guinea.

■ According to Captain Paul Hobbs, of the 110th, it was the availability of a Telstra MiniSat phone to medical staff that was responsible for saving the young man's life.

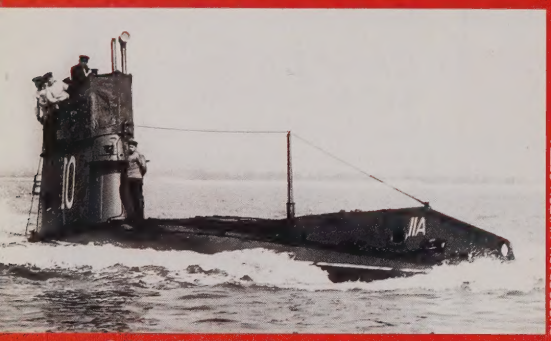
■ "Early on in Bougainville we were present when one of the local chief's sons fell into a campfire. Needing urgent medical attention, we immediately organized a medivac to our logistic support team headquarters in Loloho," he said. "The boy was badly burnt around his face and head, worse than some of our doctors had seen before". They needed some advice quickly – and this is where the Telstra MiniSat came in.

■ "Using a digital camera, our doctors took photographs of the boy's injuries and sent them as data via the MiniSat terminal to a burns specialist in Australia. Once the specialist had received and examined the pictures, he phoned back and gave our doctors the advice they needed to treat the burns.

■ "With the specialist's help our medical staff's quick action was able to save the boy's life."

● LOCAL COLOURS: Papuan tribal body paint

PHOTOGRAPHS: TONY STONE



PHOTOGRAPH: HULTON GETTY

COMING UP FOR AIR: An old sub resurfaces

Spencer marks the spot

Nothing stirs Australian souls like stories of the Anzac campaign and Gallipoli. So when the wreck of an Australian World War One (WW1) submarine was discovered off the coast of Turkey, newspapers, TV and radio were queuing up for news.

Sydney dentist and underwater diver Dr Mark Spencer identified the sub, the AE2, after a series of dives in the Sea of Marmara, near the fishing town of Karabiga. Despite poor cellular coverage in the area, he and his team were able to send up-to-the-minute accounts of their progress over a Telstra MiniSat phone.

"The story of the AE2 in Gallipoli is a great story of Australian self-sacrifice, courage and determination which has been largely unknown to most Australians until now," Dr Spencer said. "Keeping the Australian public constantly informed about the project through the media was very important to us. With Telstra MiniSat, we could communicate the story to the world as it happened." The AE2 was one of two Australian E-class submarines in active service during WW1. It was the first submarine to penetrate the Dardanelles Strait in 1915 before it was scuttled off the Gallipoli coast after suffering damage to its engine room.

As well as using the Inmarsat mini-M phone to speak with the media, Dr Spencer's team called the Australian defence minister's office regularly to keep the government informed on their progress.
"Mobile phone coverage was unreliable during transit and at the dive site coverage was weak and sometimes intermittent. It was much easier to use the MiniSat because we could call from anywhere," added Dr Spencer.

TIPPING THE SCALES

The UK government ministry tasked with protecting fish stocks is tipping the scales against quota violators by using the Inmarsat Aero-I services on board its Cessna patrol aircraft.

Elliot Morely, the minister for agriculture, fisheries and food, recently received first-hand experience of the aircraft and received an in-flight demonstration of the capabilities of the Aero-I system in establishing voice communications with fishing patrol vessels.

"The system significantly increases the ministry's operating efficiency by allowing inspectors and others operating in remote areas to report their findings immediately. We are extremely pleased to be able to take advantage of this latest technology communications equipment," said the minister.

Two turboprop Cessna 406 aircraft were fitted with Honeywell/Racal's Aero-I Satcom system. The size of the Cessnas made them ideal candidates for Inmarsat's intermediate-gain service, which was developed especially for short-and medium-haul regional aircraft.

■ The Aero-I service has received the final critical stamp of approval for operation from the US Federal Aviation Authority (FAA), clearing the way for use of Aero-I's voice and data capabilities by airline flight crews and passengers. The FAA issued the formal supplemental type certificate (STC) to Honeywell, covering the installation of Honeywell's six-channel Aero-I equipment on board Boeing 737-800 aircraft belonging to Hainan Airline and Royal Air Maroc. The certification process ensures that the Aero-I equipment does not affect other aircraft systems under any conditions.

PHOTOGRAPH: TONY STONE

GUTTED: Stock quota violation is being now carefully monitored

In a separate development, the US Federal Communications Commission (FCC) has relaxed restrictions on the use of Inmarsat services by aircraft operating over the United States.

In an order, released in November, the FCC approved use of Inmarsat services, via US service provider Comsat, for international flights – defined as "an aircraft travelling between the US and a foreign point or an aircraft whose flight originates or terminates at a foreign point and lands at one or more points in the US".

CO-ORDINATED RESCUE PLAN

■ Almost 20 years after the adoption of the International Convention on Maritime Search and Rescue, Australia has approved the search and rescue plans for the Indian Ocean, the final region to be covered by the Global Search Rescue Plan.

■ This agreement among the maritime states bordering the Indian Ocean ensures that there is a rescue co-ordination centre (RCC) that has accepted responsibility for maritime search and rescue in every part of the sea.

"This significant step represents the culmination of more than 10 years of work by the international maritime community," said Andy Fuller, Inmarsat's manager of maritime safety services. "It ensures that, no matter where a vessel is in the world, its distress message will be heard and acted upon. We hope to be able to program the matrix of rescue centres into future Inmarsat-C terminals so that the distress alert from a ship goes directly to the RCC responsible for that part of the sea."

DANISH FERRY WINS RECORD

A Danish passenger ferry, the *Cat-Link V*, won the coveted Hales Trophy for crossing the Atlantic in record time despite being forced to back-track for two hours after being summoned to join a search and rescue mission.

The Australian-built vessel, which was bristling with Inmarsat-A and C equipment, crossed the Atlantic from New York to Bishop Rock outside Southampton, England, in two days, 20 hours and nine minutes – the first to complete the legendary 'Blue Riband' voyage in less than three days.

Along with other vessels in the area, the *Cat-Link V*, a 91.3 metre car and passenger double-hulled catamaran ferry, received an emergency call from the rescue co-ordination centre in Halifax, Canada, to search for a single-engine small aircraft, which had sent out a mayday signal during a westward transatlantic flight.

"*Cat-Link V* turned around and went back against its course. It found wreckage and took it on board, but no survivors," said Bertel Thomsen, of Danish-Australian company Cat-Link Shipping.

The most famous of all winners of the Hales Trophy was the *SS United States*, which captured the Blue Riband on its maiden voyage in 1952.

The *Cat-Link V* was able to beam back data on its position, heading and progress, while weather updates were sent directly to the vessel by the challenge organizers to ensure the crew had the most recent forecasts to hand.

FISHY BUSINESS

■ A satellite buoy has been developed that uses the Inmarsat-D+ service to track special floating pallets designed to lure schools of tuna to feed on the smaller fish that congregate in their shadow.

■ Fishing vessels can drop up to 100 such pallets during a trip, so it is important for the fishermen to ensure the floating rafts can be found again and, ideally, when the tuna are feeding below. So Zunibal, a Spanish company, has developed a high-tech buoy which is fitted with a sensor to measure water temperature, GPS equipment to pinpoint the position and an echo sounder to detect whether tuna are present.

■ The buoy is tethered to the pallet and beams the information back to the fishing vessel via the Station 12 Inmarsat-D+ facility. And because the Inmarsat service is two-way, it can also be used to switch on locating lights and provide battery and solar panel management.

CASHPOINT IN THE SKY

A company has been set up to offer airline passengers in-flight cash machines, after successful trials of real-time PIN verification using Inmarsat's aeronautical X.25 Data-3 service.

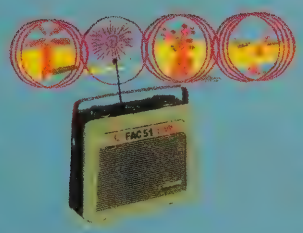
● The automated teller machines (ATM), otherwise known as 'hole-in-the-wall machines', will offer the travelling public a variety of financial services, such as credit, debit and foreign current exchange transactions, requiring real-time online validation of PIN and authorization codes.

● The company, In-Flight ATI, will have a staff of 50 based in Eire and a further 25 in California, and will offer services to airlines world-wide. "Only the quality and reliability of Inmarsat Aero Data-3 could make such a critical service as in-flight banking viable," said Dick Smith, aero technical manager at Inmarsat.

THE DESERT SINGS

● The sounds of the Sahara were heard up and down the length of Spain when 300 local radio stations broadcast a 'desert party' of music recorded just hours before in a far-away and forgotten corner of Africa.

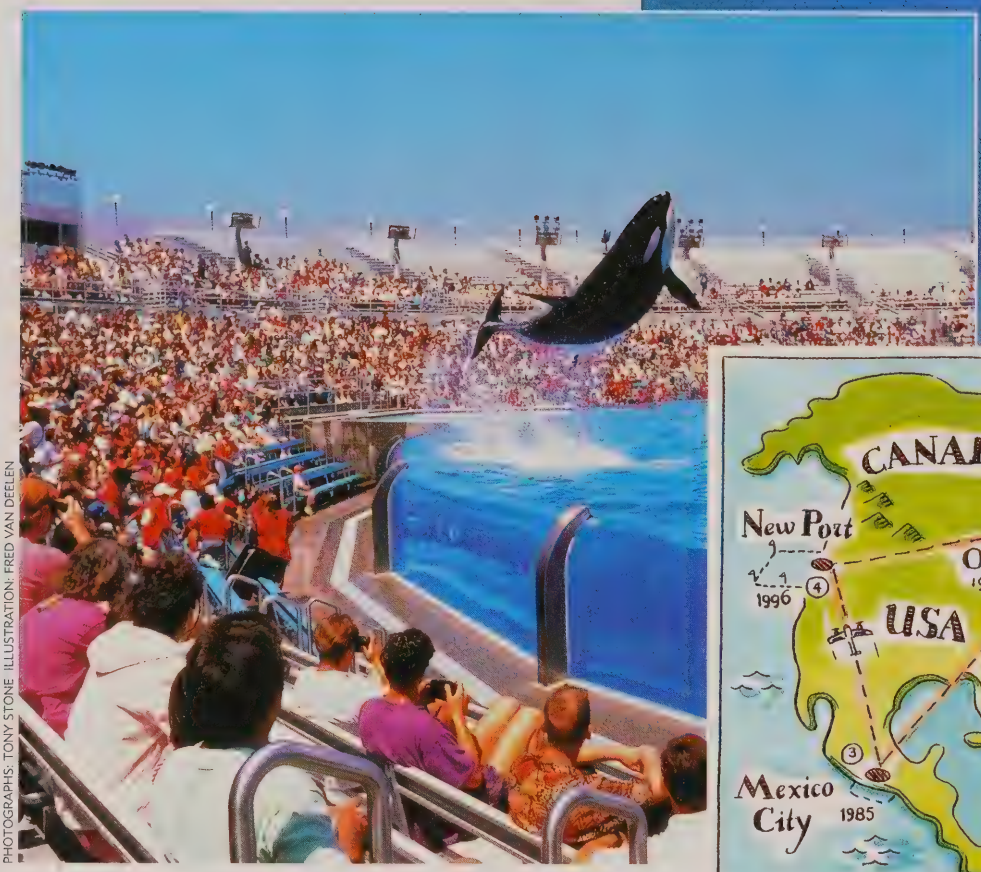
● The live flamenco music session was staged at the Auserd refugee settlement in the south-west tip of Algeria and beamed to the Sociedad Espanlo ile Radiofusión (SER) studio in Madrid over the Inmarsat-B high-speed data service.

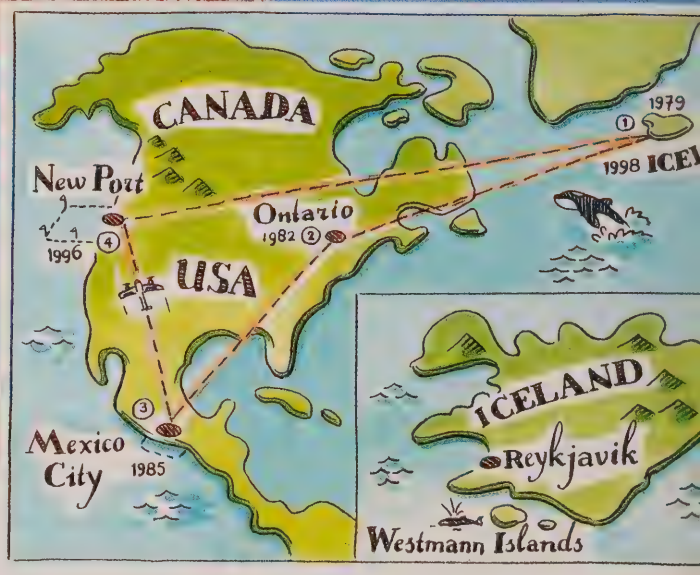


● The broadcast was organized to help collect school books for the children of Saharawi refugees who left their homes in the former Spanish domain of Western Sahara 20 years ago when the country vanished at the end of the colonial era.

● SER received the broadcast quality sound over a Nera Saturn-B terminal, while producers staff at both ends liaised during transmission using a Telnia Mobiq mini-M phone supplied by Tecnobit Communications.

ILLUSTRATIONS: SALLY GROVER





PHOTOGRAPHS: TONY STONE ILLUSTRATION: FRED VAN DEELEN

Flight to freedom

THE WORLD'S MOST FAMOUS WHALE IS FOLLOWING IN THE WAKE OF HIS FICTIONAL COUNTERPART, WATCHED BY THE WORLD VIA INMARSAT. *JACK CRAZE* REPORTS ON THE REAL-LIFE FREEING OF WILLY

IT WAS A SIMPLE TALE THAT CAUGHT the imagination of the world. *Free Willy*, the film released by Warner Brothers in 1993, told the story of a performing killer whale who, having suffered at the hands of unscrupulous amusement park owners, is helped to freedom by a young boy.

The film and its sequels were a huge success, the tamed and affable orca winning the hearts of millions as he plunged from one adventure to the next, spurting water jets from his blowhole and liberating captive whale brethren from the nets and enclosures of man.

But while Willy made joyous whale-song and swam off into the sunset, a darker story was unfolding the other side of the screen. So often actors' film roles belie their off-screen traumas and tribulations, and Keiko the killer whale, now famous as the eponymous lead in *Free Willy*, was no exception.

A SAD DECLINE

After filming, Keiko was returned to cramped accommodation and an uninspired routine of back-flips and ball-tricks at Reino Aventura marine park in Mexico City. Unbeknown to an adoring public, box office returns were looking a lot healthier than the whale. Indeed, after 15 years of captivity in numerous parks and aquariums, Keiko the killer whale's mental and physical abilities had become dulled, his body disfigured with welts and lesions, while his general health had reached rock-bottom. Furthermore, his long-term dependency on humans meant that he would stand little chance of survival in the wild should he ever meet the good fortune of the fictitious Willy.

Yet for Keiko, the gulf between film role and real life is on the way to being bridged. When an article appeared in *Life Magazine* in November 1993 documenting Keiko's conditions and decline, thousands began to demand that action be taken. It was time, the world

● MAKING A SPLASH: The open ocean beckons (above), after Keiko's early years of captivity, upheaval and relocation (see map)

decided, for the whale to return to native waters; it was time to free Keiko.

However, a long and complicated history had first to be taken into account.

WILLY REHAB

Keiko was born in 1978 in the cold waters of the Atlantic Ocean somewhere off the coast of Iceland. After capture in 1979 his early years were fraught and uncertain. Various relocations and intense periods of training and performance saw him constantly on the move, before being sold to Reino Aventura in 1985. Much of the *Free Willy* location filming took place within the Reino complex, and it was with the park's collaboration in early 1994 that Warner Brothers producers, Richard Donner and Lauren Shuler-Donner, began looking for a better home for Keiko, settling finally after lengthy negotiations on the Oregon Coast Aquarium in Newport. This was to be used as a rehab facility, where staff would set about preparing Keiko for repatriation and release into the ocean, looking to improve his underwater vocalizations, aerobic capacity and cardiovascular fitness, whilst also redeveloping his hunting skills.

Things began to move very quickly. The Oregon project was approved and **The Free Willy Keiko Foundation** was formed, with generous financial donations and the backing and blessing of the nation, schoolchildren across America eagerly awaiting Keiko's arrival in the States.

The move itself took place on January 7, 1996. Undaunted and utterly compliant, Keiko was airlifted by United Parcel Service to Newport Municipal Airport before plunging, for the first time in 14 years, into natural cold sea water, pumped continually into the pools of the Oregon site. And here, over the course of two years, Keiko blossomed; building up much needed strength, speed and weight, while fending off feared liver and respiratory infections and learning to hunt, with increasing success, the live steelhead trout thrown daily into his waters. In his new home no behavioural anomalies or disorientation problems were observed, and teams of specialists were able to carry out crucial cetacean research, making Keiko the most closely studied killer whale in history.

NORTH ATLANTIC

But an even bigger challenge and even greater journey now lay ahead, the success of which would determine Keiko's future as either pool-bound pup or wide-ocean rover. Before the foundation could even contemplate releasing Keiko into the wild, he had to be reintroduced to the sounds and sensations of his native environment – to recommunicate, if possible, with other cetaceans and to continue his acoustic and physical developments in more natural surroundings.

About 800km of eastern North Atlantic coastline were scouted in the search for the next relocation site before the Vestmannaeyjar, or

Keiko's mental and physical abilities had become dulled, his body disfigured with welts and lesions, while his general health had reached rock-bottom

PHOTOGRAPHS: TOM ORDWAY/THE FREE WILLY KEIKO FOUNDATION

● HAULED IN: Keiko is lowered into his new floating seapen in Klettsvik Bay, Vestmannaeyjar

Westmann Islands, were finally targeted.

The Vestmannaeyjar are a group of small islands south-east of Iceland's capital city, Reykjavik, and were selected on the strength of the steep cliffs, deep fjords and bays that are typical of the area and that offered, in the words of foundation executive Bob Ratliffe, "the opportunity to locate Keiko's floating pen in an extremely well-protected and picturesque site". The marine life of Vestmannaeyjar was also seen to be conducive to Keiko's final recovery, replete with capelin, his new fish diet, and frequently visited by other cetaceans, namely pilot and killer whales. Furthermore, these were his birth waters, and the people and government of Iceland warmly welcomed this epic homecoming.

RIDING IN COMFORT

Keiko's innovative floating seapen, designed and custom built in Washington state, was transported and anchored to the bottom of Klettsvik Bay on the Island of Heimay in late July. All that remained now was to shift the 4500kg whale from Oregon to Iceland – a huge and complicated task, for which a US Air Force C-17

Watching Keiko on the Web

WEBCASTING VIA INMARSAT

● The Keiko airlift was a truly remarkable event. Not only was it a moment of perfect harmony between animal, man and machine, but it testified to the growing success of advanced streaming media technology, such as the RealPlayer video and audio interface from RealNetworks.

● The arrival of RealPlayer has given rise to the new Internet buzzword of 'webcasting', an extension of traditional radio and TV broadcasting using text, video and audio over the World-Wide Web.

● For information, education and training, webcasting is proving an excellent tool for specialized trades and interest groups who want to be joined interactively in a particular event via private video broadcast – as with the Keiko airlift.

● It's now a fact that, every week, more than 145,000 hours of live sports, music, news and entertainment are broadcast over the World-Wide Web using RealNetworks' technology, amounting to hundreds of thousands of hours of content available on demand.

● Inmarsat, too, has found its own place at the heart of the streaming media revolution. Its high-speed mobile satcom services allow video and audio to be beamed almost instantly on to the Web from even the wildest places on the planet, at speeds up to the equivalent of a 64kbps ISDN landline. For publicity hungry explorers, expeditions and sportsmen, it makes

Globemaster had to be employed. Keiko was to travel in a 16,000kg transport container, partially submerged in cold water, creamed with lubrication and hosed down every step of the way, the foundation taking every possible measure to ensure his comfort and safety.

UNIQUE CAPABILITY

The plane itself was enlisted, as General Michael Ryan declared, as "the only plane in the world that could perform this mission. Its cutting-edge technology giving it a unique capability to lift huge loads over long distances in to and out of short runways".

The day of the flight, September 9, was a momentous occasion. Reykjavik, heaving with journalists, had become a hub of activity and excitement, the build-up to this arrival having attracted attention from all over the globe. Keiko's story and struggle had become the focus of many diverse individuals, institutions and governments, all of whom could be united in their final viewing of this extraordinary journey by the live Internet multicast made possible by Ericsson, RealNetworks and Inmarsat. Combining Ericsson's expertise in wireless networks and RealNetwork's leading streaming media technology – presenting video and audio over the Web – Keiko's nine-hour haul was 'webcast' to many thousands who were able to take part in this truly historic event.

Air Force Communications Agency's (AFCA's) Hammer Adaptive Communications Element swung into action alongside Ericsson, with Sgts Michael Riley and Sam Moore accompanying Keiko on board the C-17 in order to provide the crucial communications link from aircraft to satellite and back to Scott Air Force Base III. It was here, on the ground, that the real-time video images were relayed to the Net, with 30-minute video updates keeping anxious viewers posted.

In all it was a flawless airlift, and a truly great day for the foundation, for Keiko, and all his supporters.

The very best in transport and communications were enlisted to return Keiko to his native waters, where he continues to thrive. Jean Michelle Cousteau, eldest son of the late ocean explorer Jacques-Yves Cousteau, took an active role in the foundation's endeavours and projects, and saw in Keiko's move the dream of both environmentalists and schoolchildren come close to fulfilment.

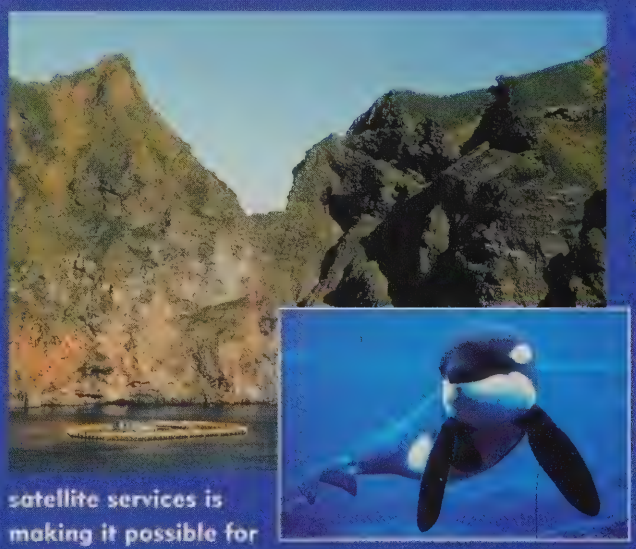
A FOCAL POINT

"My father taught us how to understand and appreciate marine life," Cousteau remarks. "Children around the world who saw Keiko return to his home will think about the possibilities this move represents. Keiko can focus people's attention on the oceans, their inhabitants, and how we treat them." And liberated now from marine park routines of sardines and somersaults, the rehabilitated orca is adapting to his new habitat, moving closer to the long-term goal of release into the wild. Only then can Willy's Hollywood fictions become Keiko's sweet sea reality

commercial sense to be able to tap in to the global audience potential of the Internet.

- As well as voice communication, the ability of Inmarsat-B service to transport digital data at speeds from 9.6kbps up to 64kbps has made it particularly popular among journalists and adventurers looking for an instant connection that will 'get the event' back to media centres and Web servers 'as it happens'.

- The unrivalled range of Inmarsat's mobile satellite services is making it possible for millions of people around the world to enjoy, simultaneously, the interactive connectivity of the Web combined with the excitement of sound and vision reserved, until now, solely for the realm of broadcast television. And the Keiko story is only the beginning.



THE PROCESS:

- Video footage is down-loaded to a laptop, edited, digitally compressed and then beamed over the Inmarsat satellites

- At the server side, footage is first of all decompressed and re-edited if needed, and put on to a Web or video server

- Net surfers can then view the footage using the appropriate Web browser plug-in application, such as RealPlayer.

NETBENEFITS

A thriving new industry caters for business people who want to own an airliner – but only for a week or two. *Keiran Daly* finds out the details

IN 1986 RICHARD SANTULLI'S BUSINESS did not exist. Indeed nothing like it existed. Today it operates 152 jet aircraft, has a further US$7.5 billion worth on order, and serves 1,100 customers.

Through the company he founded, Executive Jet, Santulli has done nothing less than create an industry – the corporate jet fractional ownership industry. Jet's NetJets programme has brought the use of private jets within the grasp of hundreds of individuals and small businesses that could otherwise have never afforded them. It has revitalized an aircraft market that was at risk of stagnation as it came to rely to a dangerous extent on repeat business. So dramatic has been its effect that last year it accounted for very nearly one-third of all corporate jet sales world-wide.

FATAL FLAW

And in October last year the company, which in little more than a decade had rewritten the history of corporate aviation, stunned observers by placing an order for up to 25 Boeing Business Jets (BBJ) – Boeing 737 airliners with VIP interiors for private use. Perhaps more remarkable still, this whole empire had – and still has – at its root a single, simple insight into how to address an industry's fatal flaw.

The flaw was that corporate jets were almost always too infrequently used and too expensive for more than a relatively small number of customers to justify their purchase. Consequently the market was suffering from agonizingly slow growth.

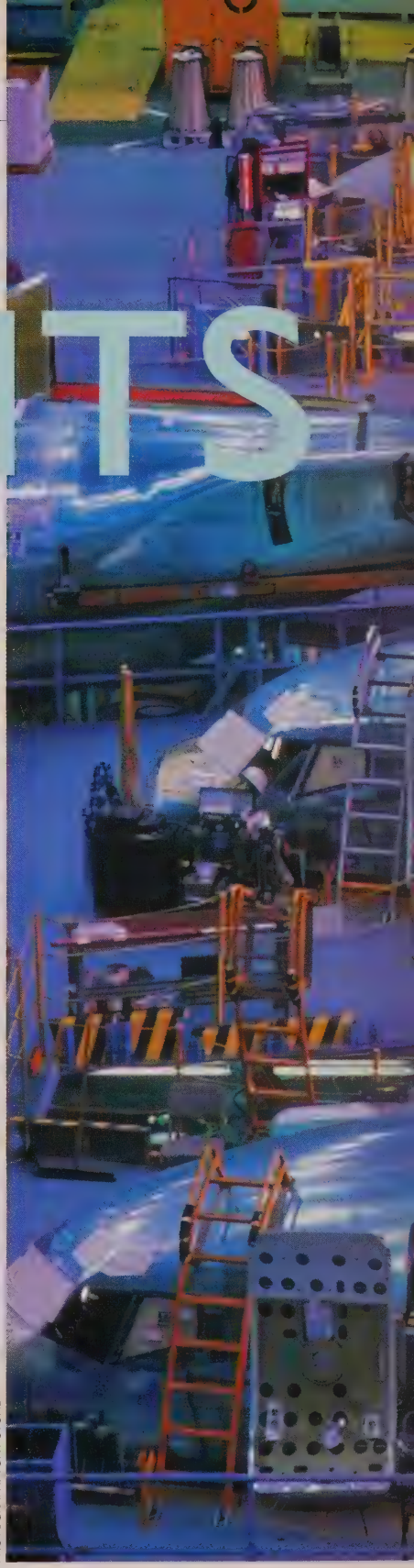
Santulli's insight was that a scheme could be devised for a third party to own enough aircraft to let a much larger number of customers use the aircraft when they needed to – even with a guarantee of a machine being available at a few hours' notice. The third party was New Jersey-based Executive Jet, and the scheme worked beyond anyone's wildest imaginings.

BUSINESS SOLD

Very simply, customers pay a flat monthly fee for a share of a specific NetJets aircraft which ensures them a given number of flight hours per year in it, and are then guaranteed use of the designated type of aircraft at four to six hours' notice, depending on aircraft type.

In July last year Santulli, whilst retaining his position as chief executive officer, sold the business to US stock-market guru Warren Buffett's Berkshire Hathaway group for the best part of US$1 billion. Buffett had become aware of the company when his wife took a quarter-share in a NetJets aircraft.

Unsurprisingly, given the calibre of individuals typically flying in NetJets aircraft and their likely economic power, Executive Jet is an enthusiastic satcoms user. Virtually all the fleet is equipped with Inmarsat Aero-H avionics, as well as five years' subscription to Medaire's MedLink remote medical diagnosis and advice service, courtesy of manufacturer Boeing.



PHOTOGRAPH: TONY STONE

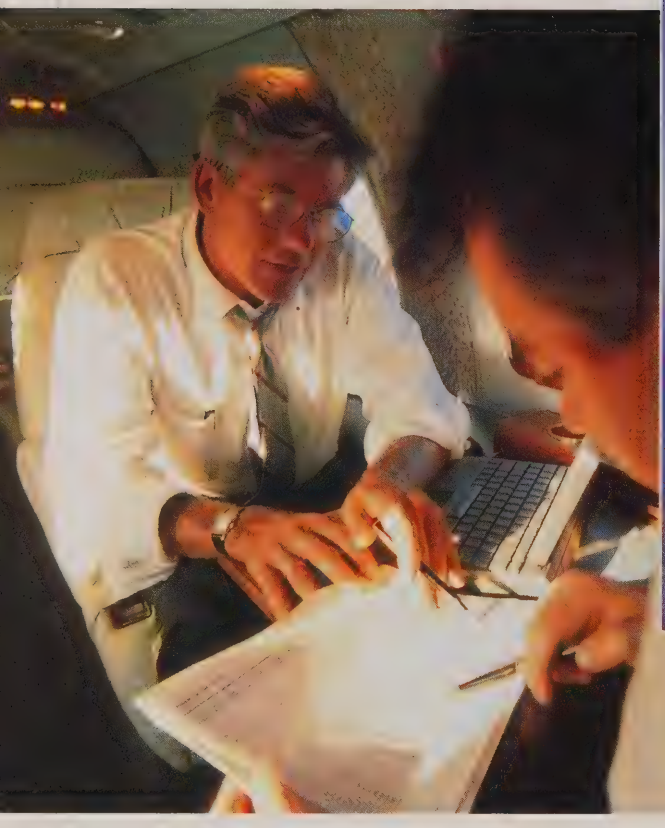
● JET SHOP: BBJ technicians ensure maximum comfort and convenience for passengers

Executive Jet vice-president of marketing Charlie Lynch says the system

is used by both crew and passengers. "We have air-to-ground data systems for the crew," he explains, "which gives them added control."

In the passenger cabin the issue is more complex, with NetJets' customers demanding guaranteed communications whenever they need them, but also relishing the enforced privacy afforded by their time in the air.

Lynch explains: "From the passenger perspective we need complete voice and data communications. But many of these folks are using these aircraft as flying offices, and one of their most valuable commodities is peace.



● FLYING HIGH: Business as usual aboard Boeing Business Jet

> THE MEDLINK SERVICE PROVIDED ON THE BBJ AND ON NETJETS' OTHER AIRCRAFT ADDRESSES THE SERIOUS ISSUE OF THE HEALTH OF HIGH-NET-WORTH INDIVIDUALS WHO ARE OFTEN AMONG THEIR COMPANIES' MOST PRECIOUS ASSETS

"They only want to be able to call out. If the phone starts ringing then it leads to wasted time. They need the ability to make contact, and satcoms are a way to have their assistant send information and make outbound calls, but they don't really want inbound calls."

And some of the out-going calls are not for business at all, but for booking restaurants or other personal matters.

The MedLink service provided on the BBJ and on NetJets' other aircraft addresses the serious issue of the health of high-net-worth individuals who are often among their companies' most precious assets. Lynch says that Executive Jet sees provision of the service as unarguable, explaining: "We simply have to do that in this day and age. The liability lawyers are there watching, and if there is this additional benefit that we can provide free of charge then we will do it".

WELL EQUIPPED

Satcoms have progressively evolved in the Executive Jet fleet, with all the 152 fielded aircraft having voice capability and two-thirds boasting voice and data. A growing number have multichannel systems, and all new aircraft will be so equipped. "These guys are often on-line on the computer and talking to people at the same time," says Lynch.

On the new BBJs the need for satcoms is even more clear-cut because the aircraft can operate extremely long, non-stop services with their 6,500m range. "New York to Tokyo is OK," says Lynch. "You can leave New York, crawl into bed, shower before landing, and get off the aircraft ready to do business."

On aircraft such as those, with their lavish interiors and pioneering technology such as live television, satcoms are as natural an accoutrement as wings ▼

PHOTOGRAPHS: TONY STONE, BOEING

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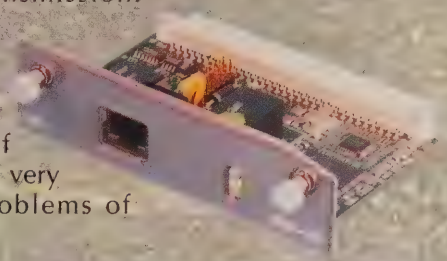

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GHOST SHIP

FANCY TAKING A TRIP ON A TRIMARAN SAILING ACROSS THE WORLD? AS *ANDREW INGLE* REPORTS, YOU WON'T MEET ANYONE ELSE ON BOARD

SOMEWHERE AT SEA THERE IS A SHIP. It has no crew. No one is on board. Yet it is navigating its way to the port of its captain's choice. And you can 'board' her any time you wish. How?

This may sound like a lateral-thinking problem, but the answer is straightforward. *RelationShip* is a deep-sea racing trimaran that is entirely remote-controlled via Inmarsat. And her voyages can be followed through every wave and past every buoy across the Internet.

BATTERED

The three satellite-linked video cameras mounted on board the hi-tech trimaran mean that, thanks to your computer, you can 'be there' live – tossed about and battered by enormous waves in the Roaring Forties or cruising serenely in the calm belt of the Equator.

This remarkable virtual sailing experience began as the vision of scientists at the University of Applied Sciences FH Furtwangen in Germany. "We and our partners see it as a challenge to set new standards in international co-operation, technological development and the exchange of experience," says Professor Rolf Katzsch, who with Professor Reiner Schmid, masterminded the venture.

From an idea presented in February 1997, *RelationShip* became a floating reality a year later. She was built on the first floor of the university building and then completed in a large tent outside. In fact, she began her voyage by air – the university is not near a river, so they required the services of the German army's largest helicopter to pick her up from the campus, hop over the Black Forest with a few wiggles and spins in the strong winds, and then plop her gently in the Rhine in January last year. The actual circumnavigation of the globe began in June.

UNMANNED

She has since sailed from Dusseldorf to Wilhelmshaven and then on to Lisbon, Portugal. At Lisbon she was – much against the spirit of the entire venture – forced to take on a crew by the authorities, who felt that she might be a danger to shipping if the navigation system failed. However, on reaching La Palma (Canary

ILLUSTRATION: DAVE F SMITH

● A SPECTRAL WAKE: Utterly deserted, *RelationShip* can sail the high seas like the galleon ghost ships of old

PHOTOGRAPHS: SYGMA

● SEA CAT: The crowds gather as *RelationShip* pulls in to dock (inset), and is boarded for maintenance (above)

How do you recognize a user of

Isles) she was granted the right to shed herself of her unnecessary human baggage provided that another manned craft escorted her on the next leg to Cape Town, South Africa. From Cape Town she is voyaging to Australia, New Zealand, Chile, Brazil, New York, Ireland and finally back to Wilhelmshaven.

TALL ORDER

It's a tall order for a relatively small vessel built by a group of students and a sprinkling of professors but, so far, the *RelationShip* has only been met by success and applause. In answer to the question, "do people think you're a little mad?" Professor Katzsch replied: "You have to be a little mad to make an idea like this work, let alone think of it in the first place".

But, everyone involved – and the lateral-minded professors in particular – is keen to stress that the *RelationShip* is an interdisciplinary project of the university. It is very much a co-operative venture.

So, on one level the aim of the project is to bring together students and staff of different departments – electronics, computer science, media, mechanical engineering, product engineering, communication and law. Teamwork is a word that continually comes up in conversations about the project. What's more, its application does not stop outside the university walls.

IDEAL OPPORTUNITY

"We see *RelationShip* as establishing a platform for the co-operation of many international partners, including individuals, universities, industrial firms and service industries," explains Professor Katzsch. Indeed what better way to cross cultural boundaries and establish friendship across borders than with such a symbol of travel and exploration as a ship?

LATEST TECHNOLOGY

And on another level, the aim is purely technological. This focus is placed on developing completely new automated control systems and remote control of autonomous systems. From sail operation to steering the swivelling video cameras, the trimaran is equipped with the latest and, in some cases, yet-to-be-released electronic technology for navigation, communication and remote-control functions.

But of course, to appreciate the *RelationShip*'s bold voyage into the history books fully you really should be there. Just switch on your computer and board: www.relationship.fh-furtwangen.de – the *RelationShip*'s website. And you won't even get your feet wet.

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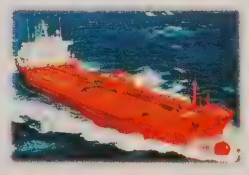

VIA INMARSAT

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France Telecom

PHOTOGRAPH: SYGMA

● STRUNG OUT: *RelationShip* is lifted from sea to shore

Key questions about *RelationShip*

■ How does she navigate a harbour?
When leaving a harbour the trimaran will be sailed by a support crew out of the 20km zone. It will then be taken over by one of the two command posts in either Furtwangen or Villingen-Schwenningen. The command-post crew will control the ship around the clock and will direct it to the 20km zone of the next port of call where it will be taken over again by a human crew.

■ What happens during adverse weather conditions?
Weather conditions at sea are the decisive criteria for choosing the course and sail positions. The team has global weather information at its disposal from WNI Oceanroutes. Based on that information they chart her course. To obtain data about the local weather they use data on wind velocity and direction, swells caused by rowing and the broadcast video images. To ensure the safety of the trimaran during heavy storms, the stern can be kept in the wind by manipulating a heavy weight behind the rudder to help guide the boat. These together with the extremely low rig are the most important precautions to protect the small vessel against the adverse conditions to be expected in the southern hemisphere.

■ How is she protected against piracy?
Many routes and straits known for piracy are not sailed without a crew. In addition, the actual position of the trimaran, known to the command post, is not published on the Internet. The three cameras installed on board will enable the command post – except during fog or at night with navigation lights turned off – to identify possible invaders. These pictures could make a remarkable media event on the Internet if invasion were to happen. The hatch cover, computers and electronic instruments are secured by electronic control.

■ How is she protected against collision?
On-board radar detectors complement the three installed cameras to detect ships and to evade them. The sails are additionally equipped with radar reflectors. Special optical recognition software analyzes red and green navigation lights of ships at night and transmits signals to the command post. Signal horns will help to avoid collisions in fog and periods of limited visibility. Risks caused by drifting objects (eg lost containers) or big animals like whales that cannot be located or evaded are part of the risk. But this danger, of course, also faces lone sailors while they sleep at night.

TECH SPEC

● Communication between the trimaran and the Furtwangen command posts happens via two Inmarsat services. Energy consumption has to be taken especially into consideration. That's why position and steering data are broadcast via Inmarsat-C because it ensures minimal energy use. This guarantees a continuous, world-wide connection between boat and the command post.

● Video from *Relationship*'s three high-resolution swivelling 3-CCD colour video cameras is beamed back over the Inmarsat-M 2.4kbps data service for uploading on to the Web.

● To minimize energy consumption for transmitting images, the Inmarsat-M is activated on demand via Inmarsat-C, otherwise it remains turned off.

● Three cameras on board film the trimaran's progress, and these can be activated remotely. Since these are mostly still images, JPEG is most suitable for data compression.

● Two Inmarsat-M connections enable the broadcast of all data including the image data of *RelationShip*. Thanks to Inmarsat, the control room can maintain continuous contact with the trimaran throughout its journey.

● A GPS receiver from Trimble delivers position data, to within 50 metres, which is indicated on the map monitor of the command post.

● And who knows, beyond crewless trimarans, the technology used in the *RelationShip* project may one day be turned to other maritime applications, giving rise to crewless trawlers, cargo vessels and tankers and oceans of ghost ships.

SAINSEL

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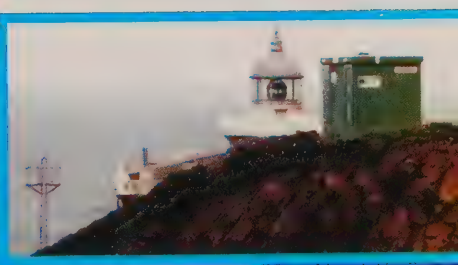
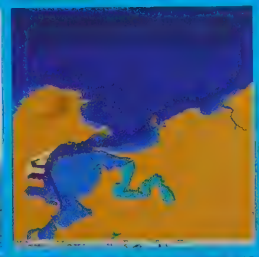
Making the Pieces Fit...





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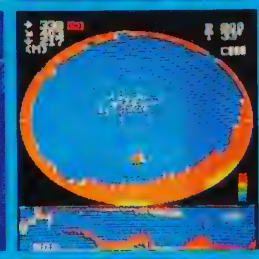

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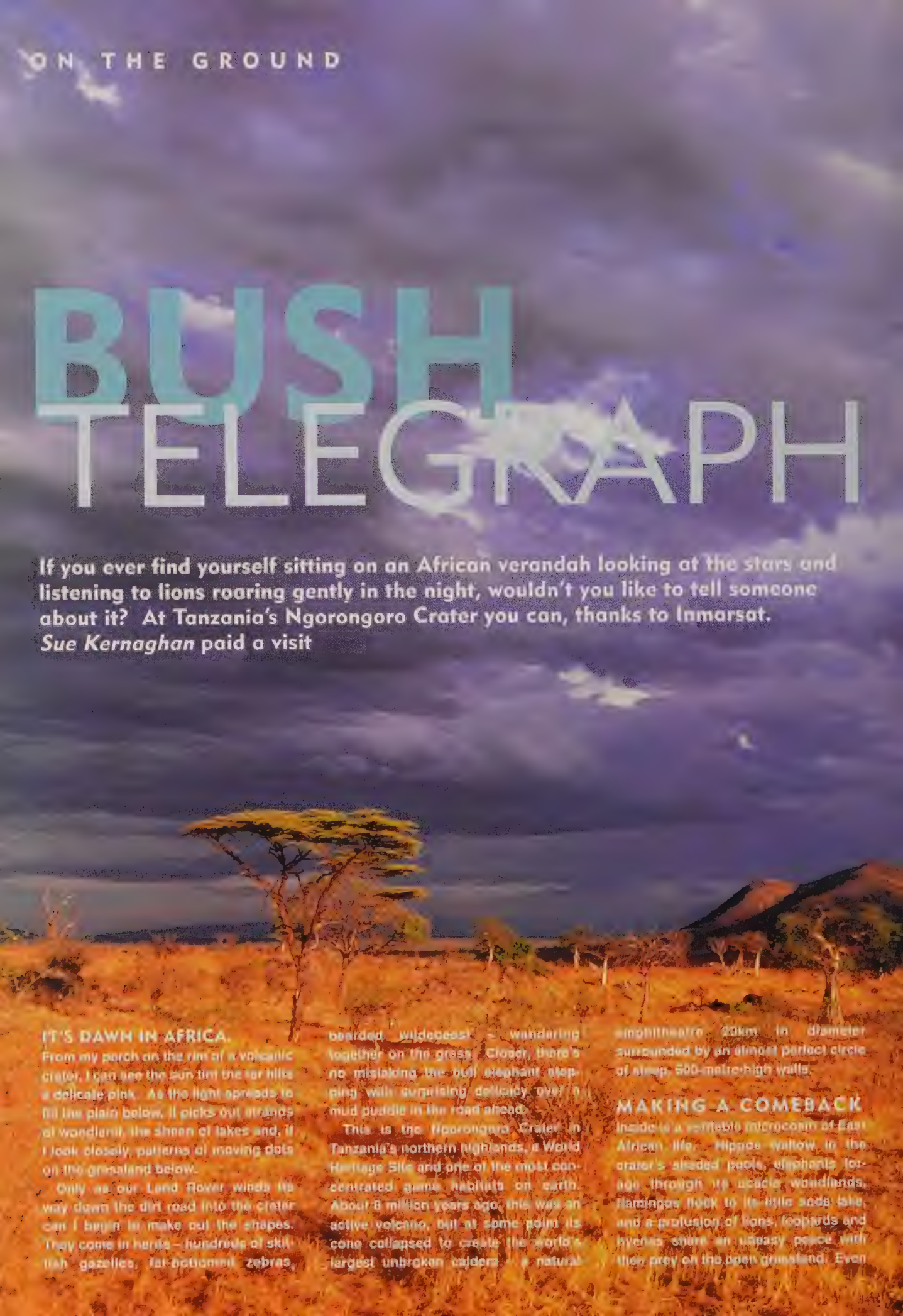
BUSH TELEGRAPH

If you ever find yourself sitting on an African verandah looking at the stars and listening to lions roaring gently in the night, wouldn't you like to tell someone about it? At Tanzania's Ngorongoro Crater you can, thanks to Inmarsat. *Sue Kernaghan* paid a visit



IT'S DAWN IN AFRICA.

From my perch on the rim of a volcanic crater, I can see the sun tint the far hills a delicate pink. As the light spreads to fill the plain below, it picks out strands of woodland, the sheen of lakes and, if I look closely, patterns of moving dots on the grassland below.

Only as our Land Rover winds its way down the dirt road into the crater can I begin to make out the shapes. They come in herds – hundreds of skittish gazelles, far-bottomed zebras, bearded wildebeest – wandering together on the grass. Closer, there's no mistaking the bull elephant stepping with surprising delicacy over a mud puddle in the road ahead.

This is the Ngorongoro Crater in Tanzania's northern highlands, a World Heritage Site and one of the most concentrated game habitats on earth. About 8 million years ago, this was an active volcano, but at some point its cone collapsed to create the world's largest unbroken caldera – a natural amphitheatre 20km in diameter surrounded by an almost perfect circle of steep, 500-metre-high walls.

MAKING A COMEBACK

Inside is a veritable microcosm of East African life. Hippos wallow in the crater's shaded pools, elephants forage through its acacia woodlands, flamingos flock to its little soda lake, and a profusion of lions, leopards and hyenas share an uneasy peace with their prey on the open grassland. Even

the black rhino, recently poached almost to extinction, is making a comeback in this enclosed, protected space. Animals can leave, by the same roads that tourists arrive on, but most choose not to. What keeps them here, besides relative safety from poachers, are the underwater springs that support life in the crater even when all else is parched.

There's no sign of drought today. It's winter, and the short rains have left the landscape a vivid green.

PASSIONATE

My guide is Ian Vincent, the operations manager for Sopa Hotels, an Arusha-based company which operates one of the few lodges on the crater's rim. Vincent is just the sort of person you want on your safari.

Originally from Kenya, he worked his way around East Africa as a pilot and a photographer before taking up hotel management. He's also, like so many Africans, passionate – without being sentimental – about wildlife.

What's the most exciting thing to watch? "The kills," he says, without hesitation. "I've seen three lions bringing down a buffalo. It's an amazing sight." But ordinary behaviour can be just as gripping, he adds. "People tend to say, 'we've seen a zebra, we can go now', but you can sit and watch a zebra for days. The social interaction is fascinating."

His advice? Don't rush it. "Your first day of a game drive is usually spent seeing what you can find. You may

PHOTOGRAPHS: TONY SWONE

BUSH TELEGRAPH

have just found a pride of lions when it's time to leave. The next day you know where they are and you can go back and see what they're up to. You can take the time to get to know them."

This is what we do. By the time we've found our lions they've long since made their kill for the day and are lying in somnolent heaps, tummy side up.

ANCIENT FINDS

Their indifference is astounding. In fact, none of the animals, not even the twitchy warthogs or jittery gazelles, seems the least bit concerned by the six-headed, shutter-snapping Land Rover that's watching their every move. It's a humbling reminder that we're not the centre of the universe.

Humans do have a place in this landscape; it's just not as far up the pecking order as we're used to. Near the crater, and still within the confines of the much larger Ngorongoro Conservation Area (NCA), are the Olduvai Gorge and Laetoli, where archaeologists, most famously doctors Leakey and Leakey, have found evidence of human life dating back several million years.

These finds have earned the NCA a place in the popular imagination as the birthplace of mankind. That, and the region's idyllic self-sufficiency, invites inevitable allusions to the Garden of Eden. In this case, the temptation is to create the kind of intensive tourism seen in other popular safari spots, but it has been admirably resisted by the Tanzanian authorities.

"Tourist numbers are growing, but the Tanzanian government is extremely protective of the national parks, the environment and the ecology. They do not want the place swarming with tourists," says Vincent.

Rules are strict in the conservation area: no off-road driving, no littering, no overnight camping in the crater – and no more construction.

There are now five lodges and camps on the crater rim, as opposed to the 30 or so in Kenya's popular Masai Mara game reserve, and there are unlikely to be more. "The Tanzanian government has put a stop to further development," says Vincent. At the Ngorongoro Sopa Lodge, my fellow guests and I are alone on the crater's eastern rim, a long way from our neighbours, 170km from Sopa's head office in Arusha, and 100km by rough dirt road from the nearest landline phone.

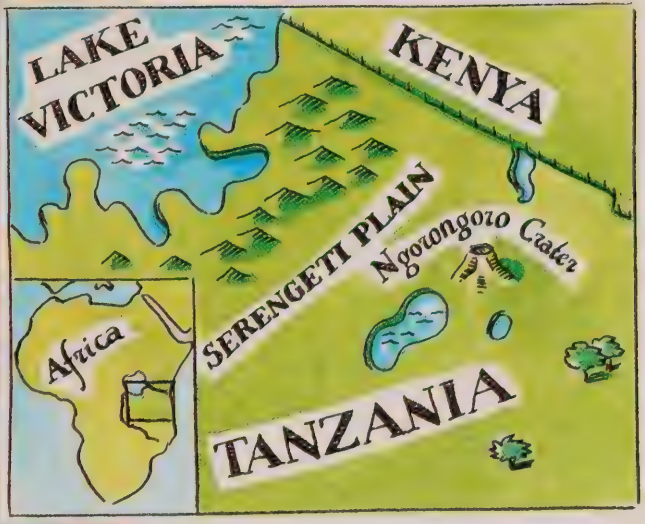
"Visitors to Tanzania come into a pristine wilderness," says Vincent. But the guests at Sopa, who enjoy comforts like a crater-edge swimming pool and five-course meals, don't come to rough it.

That's why the hotel has arranged for two Inmarsat satellite phone systems – one for guests' use and one for management – and another two systems at Ngorongoro's sister lodge in the Serengeti National Park.

"We use the phones for the guests'

TECH SPEC

- Perched on the lip of the world famous crater, the Ngorongoro Sopa Lodge has two mini-M Nera WorldPhones and an Inmarsat-B terminal. Guests dial an operator in the US and charge the call to their credit card. Every one of these calls goes through the Morsviazsputnik land earth station.
- The Serengeti Sopa Lodge also has two mini-M Nera WorldPhones, and also uses an Inmarsat-M system.
- Both systems are supplied by Wilken Afsat Tanzania in Dar es Salaam. Says Wilken Afsat general manager Greg Almeida: "All of these lodges are out in the bush, the only roads are dirt roads, and when they have a problem we have to go out in the field and rectify it. This doesn't happen often. We are extremely happy with the installations that we've done".
- By April, Nera WorldPhones and Inmarsat-B terminals will be installed at all Tanzanian Serena Lodges, in Manyara, Ngorongoro, Serengeti, Kirawira and Zanzibar. There will be a phone in every one of the guest rooms, enabling guests to access e-mail and voice mail.



convenience and for when confidential matters need to be discussed; the radio is so public," says Vincent. Occasionally there are emergencies, he adds. "The Serengeti is only 350km from Arusha, but it takes six to seven hours to get there because the roads are so bad. One client, a diplomat and his family, broke down on the way, but he had his own Inmarsat phone with him and was able to call us for help." After that experience, Vincent is thinking about getting a system for his own use.

REASSURANCE

Sometimes, it's important just to let people know there is no emergency. In the summer of 1998, after bombings at the US embassies in Nairobi and Dar es Salaam, Sopa's American guests were keen to contact and reassure their families at home.

What their relatives did not realize was just how far the Ngorongoro Crater is from the capital, both logistically and emotionally.

On the hotel terrace, I gather with the others to watch the sun set over the distant crater wall. In the quiet of the evening, a red-robed Masai herdsman, his spear held like a staff, makes an attenuated silhouette against the tangerine sky, his cattle walking beside him in a well-tempered single file.

It's a scene that has played out every evening for thousands of years. Something gives me the confidence that, whatever politics, tourism, development and meteorology can throw at it, it will be seen for thousands more

PHOTOGRAPH: TONY STONE ILLUSTRATION: FRED VAN DEELEN

THE LONG HAUL

PATRICK HOOK VISITS A EUROPEAN HAULIER WHO HAS DISCOVERED THE HUGE BENEFITS OF FLEET TRACKING VIA INMARSAT

EUROPE'S RAPIDLY CHANGING social, political and economic landscape continues to have a significant impact on the business world and, more particularly, the haulage industry. The near collapse of the Russian economy, the launch this January of a new common currency throughout most of the states of the European Union (EU), the abolition of all trade barriers between the signatories of the Schengen Agreement and the liberalization of the rules relating to the carriage of goods (cabotage) have all affected profit margins and trading patterns.

COMPETITIVE

One of the consequences of these changes has been the decision by many of the largest haulage companies in the EU to install a satellite-based system of fleet management and control to maintain their competitive advantage. One such haulier is North Sea Express, a Belgian company based in Zeebrugge, Belgium's busiest seaport.

North Sea Express is an international haulier running a sizeable fleet of swap body trailers for the container and general haulage trade throughout most of the states of the EU. One of the largest companies of its kind in Belgium, the journeys undertaken by its drivers are often long, arduous and boring. It is not unusual for vehicles to be away from their depots for periods of between one and six weeks at a time, and changes to the schedule of deliveries and collections are frequent. Seven years ago the company was still trying to keep pace with this logistical nightmare with the daily telephone call from the driver using a public telephone kiosk – a system that continues to be used by many hauliers today.

GUARANTEED COVERAGE

Inevitably, this time-consuming and inefficient means of communication was beginning to cost the company dear in terms of lost opportunities for return loads, wasted fuel and the unproductive use of drivers' legally permitted hours on the road.

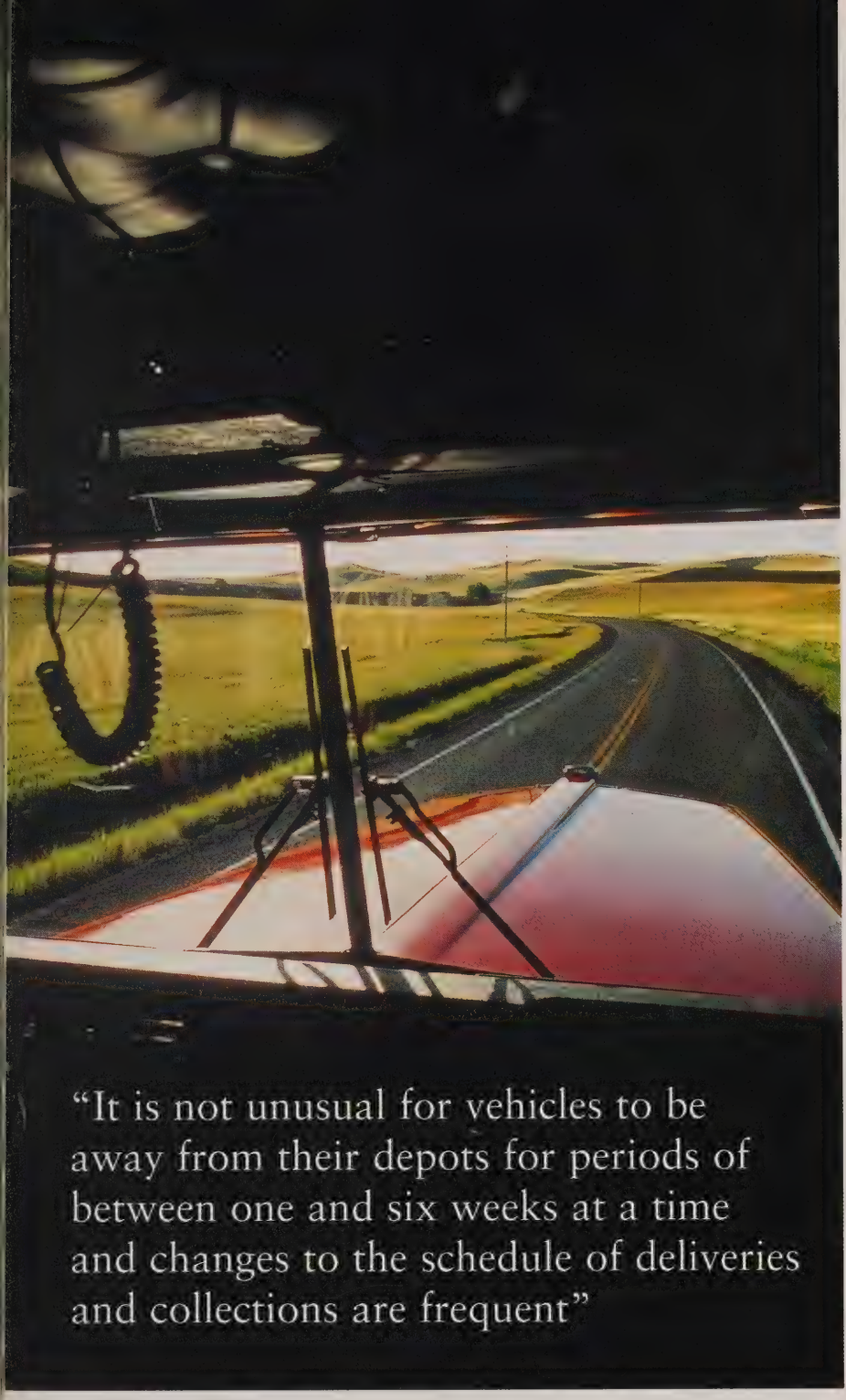
Working closely with Industrial Control Systems (ICS) in Belgium, the company decided that a satellite-based system was the best option, rather than the less adequate alternative of a terrestrial system. Guaranteed coverage and positioning information are vital, and neither GSM nor the RAM/Mobitex packet data protocols were able to offer these requirements.

"The GSM and RAM/Mobitex roll-out programmes are still concentrated on the major conurbations, and even here there are still a number of black spots where it is not possible to send or receive messages," says Ian Thomas of Inmarsat. "As for the GSM international roaming agreements, there is still a while to go before they are completed, and as soon as you move out of areas of cover you run into problems."

As a result, in 1996, the company switched to Inmarsat-C and now has Trimble transceivers fitted in all its tractor units. These are linked to an on-board ICS Truck Black Box through which drivers are able to send and receive data messages. A full-function computer, the Truck Black Box is also capable of recording a range of operational data, including speed, driving hours, periods of rest, and fuel consumption.

This information, required by law and downloaded on the vehicle's return to its base, can be sent to the fleet manager at any time, using Inmarsat-C data communications.

● AT THE WHEEL: Hauliers are now in the driving seat thanks to satellite tracking and Inmarsat



"It is not unusual for vehicles to be away from their depots for periods of between one and six weeks at a time and changes to the schedule of deliveries and collections are frequent"

PHOTOGRAPH: TONY STONE

"We wanted the flexibility that went with having guaranteed connectivity with our drivers without having to pay for those occasions when the equipment was not used," said Van Rumst. "We now have four planners and dispatchers in our control room in Zeebrugge. We can simply contact a driver or his vehicle exactly when we need to. If we want the position of a particular truck, a signal is sent to the on-board computer which then automatically sends back its location and the details appear on a large-scale electronic map. The fact that we have asked for the position of the truck will not be known to the driver unless we choose to tell him."

HUGE INVESTMENT

It is, in fact, comparatively rare for the trucks to be polled for their position. Normally a driver will inform one of the dispatchers in the control room if he is running late or has encountered a problem, and the details are then passed to the customer for his information.

However, the long periods of absence also mean that the vehicle is not being checked for mechanical faults as often as the company would like. "These trucks represent a huge investment for a haulage company and it is important that we should be able to deal with maintenance problems before they become serious," said Van Rumst. "With the vehicles away for up to six weeks at a time, the potential for breakdowns is substantially increased. The sensors on the Truck Black Box allow us to discover any faults in good time."

LONGHAND

In the case of North Sea Express, incoming messages from a truck automatically appear on the screen of one of the four planners/dispatchers in the company's control room. If necessary, these messages are then fed, via a local area network (LAN), to the fleet manager or any other part of the organization.

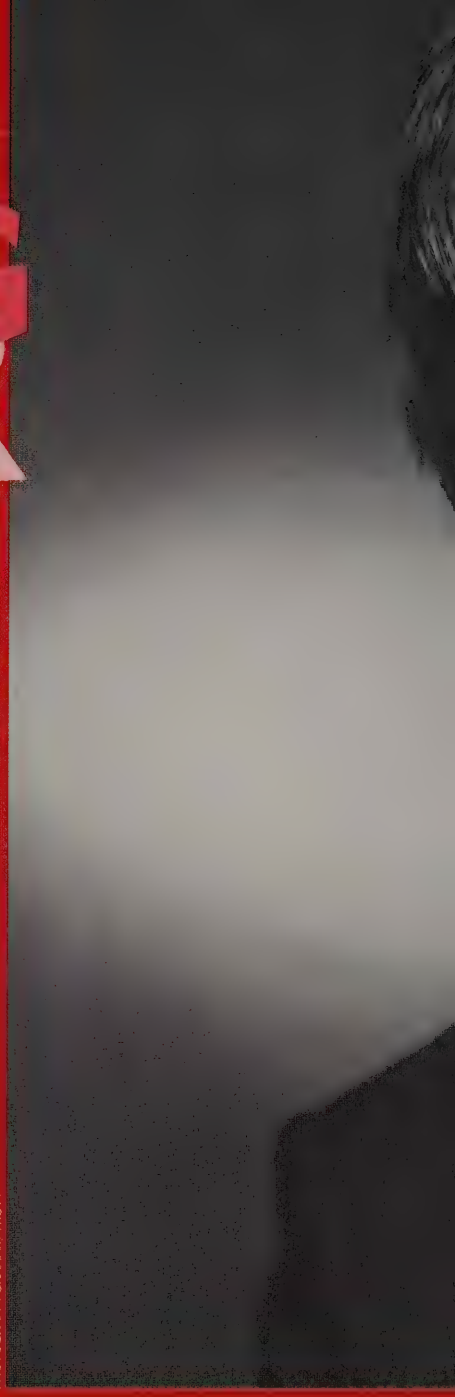
"In the days before data communications," said Van Rumst, "messages would have to be taken down in longhand and then passed on to the person for whom they were intended. If there was a message for the driver, it would have to wait until the man called in, usually at the end of the day. Now messages are typed into the computer once and sent immediately. It has drastically reduced mistakes and misunderstandings, as well as improving our competitive edge."

Using a library of pre-canned texts such as 'Arrived at Destination', 'Completed Unloading', 'Returning to Base', drivers now send routine messages with a few key strokes, effectively removing much of the stress associated with the collection and delivery of high-value loads.

"It has become much quieter in the dispatchers' office," said Rumst. "There is not such a hectic situation any more with telephones ringing all day. Things are much better now."

LADY BUG KILLER

IS THE TELECOMMUNICATIONS INDUSTRY READY FOR THE GAMUT OF PROBLEMS THAT THE MILLENNIUM BUG COULD CAUSE? TROUBLESHOOTER GILL GOVIER IS AIMING TO MAKE SURE IT IS, AS *ANDREW INGLE* FINDS OUT



PHOTOGRAPH: GRAHAM TROTT

GILL GOVIER, YOU COULD SAY, is the troubleshooters' troubleshooter. She's effectively the person making sure that well before January 1, 2000, the telecommunications companies of the world have been made fully aware of and know how to deal with the millennium bug.

No small task. But that's why Gill was chosen for the job. Already Inmarsat programme management group manager, she took on the Year 2000 project for the organization with such relish, that the International Telecommunication Union (ITU) Year 2000 Task Force invited her to become chair of the information management sub-group.

Anyone who doesn't know about the millennium bug has probably been living on another planet in recent years, but the bug has the potential to sabotage anything, anywhere in the world, that is affected by computers.

Put simply, many computers may read the last two digits of 2000 and, programmed as they are to slot '19' in front, assume that we have entered the year 1900. The result could be mayhem.

"We recognize that in the telecoms industry you are only as strong as the weakest link," says Govier. "So there is huge benefit for Inmarsat and its customers in working with the rest of the telecoms world. Come the millennium there could be places in the world where there will be no telecommunications because other carriers or their local utilities have failed to become millennium compliant. It's no good having a bug-free system if you have no electricity with which to run it."

It's amazing how many things could be affected by the date change. And given the magnitude of the forecast disaster, many people believe that the whole thing has been blown way out of proportion.

"You could not have met a bigger cynic than me at the beginning of this project," Govier admits. "I too thought it was a load of hype – a great way for IT consultants, solicitors, accountants and journalists to make a lot of fuss and money over nothing. But in fact, once we got under way and started testing our systems we realized there were some major problems which, had they not been fixed, would have caused us and our customers serious trouble.

"I now realize that there is a distinct possibility that if people do not take the millennium bug issue seriously and put 'fixes' or upgrades in place then disasters both large and small will occur," says Govier. "The danger is real."

Rectifying the problem is time consuming but not complicated. As Govier explains, the only way to verify for certain that a system will work is to test it,

> **"There is a distinct possibility that if people do not take the millennium bug issue seriously and put 'fixes' or upgrades in place then disasters both large and small will occur"**

rather than do 'code walk-throughs'. This is the way that some other companies have tackled the problem – looking through thousands of lines of code to determine if there were any dates or algorithms that could cause trouble. What Govier and her team did was to use dedicated testbeds to quite literally 'create the year 2000 before its time' and see how the systems behaved.

The code walk-through method is liable to make the mistake of only considering the dangers of the 'millennium moment' – midnight on December 31, 1999.

"What people forget," says Govier, "is that systems are in peril before and after as well as during that moment. For instance, there are a number of systems that I am aware of around the world that will fall over on December 27, 1999, because the systems will anticipate the year 2000 five days in advance."

The Inmarsat Year 2000 project began in November 1996 when it was decided to determine what, if any, were the critical elements that needed addressing before, during and after the millennium. So, after the risk analysis, research and preparation, the project started in earnest in April 1997.

"We put together a plan that handled all the mission-critical elements, such as our satellites, the ground infrastructure that supports them, and the terminals themselves, and a schedule to have these elements in control by January this year," explains Govier.

The aim of all this was to ensure that the millennium (known as Y2k in computing circles) would not prevent Inmarsat customers from enjoying the same kind of reliable, consistent service that they have come to expect.

Inmarsat's direct customers are the land earth station operators (LESOs), the organizations that run the gateways between the Inmarsat system and the terrestrial telephone network. Govier has been working closely with them and the manufacturers of the hardware and software they use, to ensure they are ready for the millennium by the end of the first quarter of this year.

Govier's job is gradually changing emphasis. While originally it concentrated on getting Inmarsat's millennium act together, it is now just as much about helping everyone else to get their act together.

There is also the potential of high telecommunications traffic over the transition to the millennium, especially with the additional usage of terminals procured specifically for the Year 2000 contingency. So Inmarsat is offering its LESOs the opportunity to pre-order a leased circuit for, say, three months. This is a circuit dedicated for their use only – best equated to a direct line, such as the one installed in the White House in Washington.

"In particular, we've been highlighting in our ongoing communications to the LESOs the need to ensure that their stations can be self-sufficient should the need arise – such as installing generators to provide back-up power. Recently, I berated one of our sites for not contacting their local water supplier to ensure they were Y2k compliant.

"Don't you know," I said, "that without fresh water-in and sewage-out you won't be allowed on your site?" To which they calmly replied: "We do have a contingency plan – we use the river!" v

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PHOTOGRAPH: ROBERT HARDING

● AFRICAN HIGH-RISE: Nairobi's bustling city centre, with outlying Masai territories and safari land, attracts business men, tourists and travellers from all over the world

NAIROBI

Kenya's Nairobi is probably Africa's leading business capital outside South Africa. And with the recent rejuvenation of the East Africa Co-operation, Nairobi is the centre of an expanding business climate. The UN's fourth World Centre, it has become the base for many aid and development agencies, as well as multinationals with an interest in East Africa. And buried as it is in the heart of safari country, there's always plenty to do for business travellers with a little time on their hands

PHOTOGRAPH: TONY STONE ILLUSTRATION: FRED VAN DEELEN

● WARM SEAS: The Kenyan coastline, less than a day's journey from Nairobi, is home to some of the finest beaches, reefs and resorts in East Africa

Nairobi's significance as a major African business centre is unquestionable. Business services, communications, the banking sector and conference facilities in this cosmopolitan capital are as sophisticated as anywhere on this continent outside South Africa. One of Africa's longest established homes for multinational business, Nairobi has developed a strong infrastructure to supply the business traveller with plenty of world-class hotels and extensive international air-links.

In fact, Nairobi has excellent international air-links via Jomo Kenyatta Airport, and is currently developing direct flights to the Americas, Australia and the Far East. About a dozen African airlines serve Nairobi, including SAA. All the major European carriers (Air France, Alitalia, Austrian Airlines, British Airways, KLM, Lufthansa, Sabena and Swissair) ensure frequent services to European capitals.

Kenya's business climate has been recently developed by a growing adoption of privatization programmes, as well as the introduction of trade liberalization policies, and some easing of restrictive interventions in capital markets.

PHOTOGRAPHS: TONY STONE, ROBERT HARDING

● TOWN AND COUNTRY: Whether you're looking for crowds or creatures, Nairobi has it all

BUSINESS SERVICES

The Kenyan government's Investment Promotion Centre offers practical, impartial, one-stop advice for overseas investors, exporters and importers. Consultation before entering any contractual commitment will generally ensure an understanding of the maze of legislation that can affect a business enterprise and, to a certain extent, outline further assistance the government can provide. Initial enquiries, in writing, should be addressed to the office of the Executive Chairman, IPC, 8th floor, National Bank Building, Harambee Avenue, Nairobi (Tel: + 254 2 221 401/4; Fax: + 254 2 336 863).

- Internet browsing – US$10 per 1/2 hr.
- Shorthand/dictation – US$15/hour
- Wordprocessing – US$7/page
- Message pager hire – US$60/week

(Costs supplied by Hilton Hotel)

CAR HIRE

Nissan Sunny or similar – from US$85/day + US$25 insurance
Land Rover Discovery or similar – from US$210/day + US$40 insurance
Driver (0800 to 1800) – US$20/day + US$5/hour overtime.
Suggested daily gratuity – US$15 + fuel and tax @15 per cent VAT

BANKING HOURS

Banks in Nairobi are usually open Monday to Friday from morning to 1500 and on the first Saturday of the month between 0900 to 1230.

ACCOMMODATION

All these luxury hotels have in-house business resource centres to assist the business traveller. Qualified and experienced professional staff, often invaluable sources of local advice, provide services such as word processing, duplication, fax and e-mail, and can arrange travel itineraries, meetings and conferences. Most can be booked at late notice.

- Hilton Hotel
Mama Ngina St., PO 30624
Tel: +254 2 334000,
Fax: +254 2 339462

- Mayfair Court Hotel
Parklands Road, PO 74957
Tel: +254 2 746708,
Fax: +254 2 748823

- Windsor Golf & Country Club
Kigwa Road, PO 45587
Tel: +254 2 862300,
Fax: +254 2 802322

- Hotel Inter Continental
City Hall Way, PO 30353
Tel: +254 2 335550,
Fax: +254 2 336742

- Utalii Hotel
Thika Road, PO 31067
Tel: +254 2 802540,
Fax: +254 2 803094

- Nairobi Safari Club
University Way, PO 43564
Tel: +254 2 330621,
Fax: +254 2 331201

- Serena Hotel
Nyerere Road, PO 48690
Tel: +254 2 711077,
Fax: +254 2 718103

- New Stanley/Ambassadeur/Panafric (Sarova Hotels), PO 30680
Tel: +254 2 333248,
Fax: +254 2 211472

USING SATCOMS

- Applicants wishing to use Inmarsat phones must register with KPTC, indicating the model, type and serial number. Contact:
Mr. Roger Ng'Otwa
General Manager
Communications Regulatory Affairs
Kenyan Post and Telecommunications Corporation
P. O. Box 30301
Waiyaki Way
Nairobi, Kenya
Tel: +254 2 449 373/174
Fax: +254 2 448 418/449180
Telex: 987 222 45

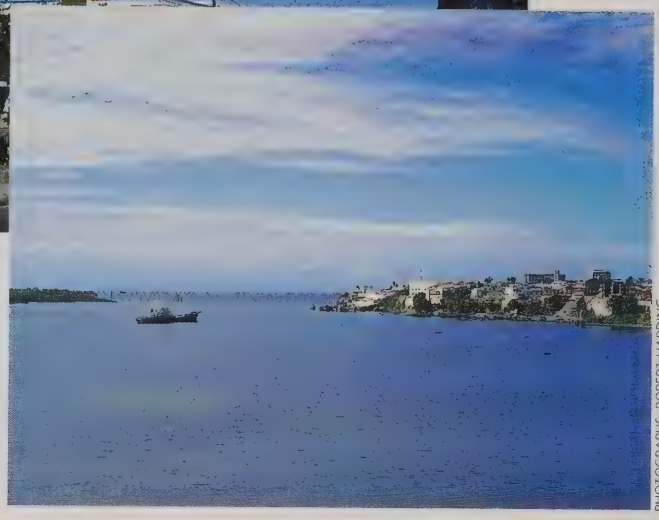
- Visitors must purchase a licence, valid for up to six months.
These cost:
- Inm-A: 17,500 Kenyan shillings
- Inm-B: 20,000 Kenyan shillings
- Inm-C: 10,000 Kenyan shillings
- Inm-M: 15,000 Kenyan shillings
- Mini-M: 17,500 Kenyan shillings

Visitors must declare their phone to customs upon entering Kenya. In addition, 16 per cent VAT is applicable.
For further information about customs duties, contact:
Kariuki Githigi
Kenya Revenue Authority
Customs and Excise Department
P.O. Box 40160
Nairobi
Kenya
Tel: +254 2 71 84 17 / 71 55 40
Fax: +254 2 71 84 17

INMARSAT PARTNERS

- Mr. Harvey Herr
Digitec House, Waiyati Way
Westlands
P.O. Box 18799
Nairobi, Kenya
Tel: +254 2 741 410
Fax: +254 2 747 464
Telex: 251 54

- International Communication Systems Ltd
P.O. Box 95221
Mombasa, Kenya
Tel: +254 1121 644
Telex: 212 89



PHOTOGRAPHS ROBERT HARDING

MOMBASA

Nairobi is also just a few hours from Mombasa, a bustling port town on a palm-fringed coast lapped by the Indian Ocean

● TUSKS 'N' TANKERS: Mombasa's famous ivory gates (top), and old port (above)

Mombasa, the second largest commercial centre in Kenya, is a city with a long history of culture and trade. Mombasa has had contact with the rest of the world for the last 1,000 years through its links with the Indian Ocean trading system, its earliest visitors being the Arabs who arrived around 1000 AD. Mombasa became a major trading centre during the 13th, 14th and 15th centuries.

RICH TEA SHIPPING

Today, the city's shipping industry is one of the oldest and most established in the region. Almost all the major International shipping lines call in at the port of Mombasa through which goods are channelled to various destinations.

Goods imported into the country include motor vehicles and spares, grain, fertilizer, sugar, second-hand clothing, etc. Export items from Kenya include tea, coffee, pyrethrum, sisal, steel products and cement.

The presence of the port and the railway which links Mombasa to Nairobi and beyond has confirmed the city's importance as a major transporter of goods.

CEMENTED TOURISM

The increase in tourism since the 1960s led to an increase in the demand for petrol and oil, and this led to the opening of a large oil refinery near Mombasa in 1963. This was an important event: Kenya had a new source of revenue and employment, and an asset worth millions of pounds.

Other large industries include a cement manufacturing plant, which was established in Mombasa in 1954 on the mainland. The cement manufactured here is consumed locally and exported mainly to Uganda, inland Africa and the Indian Ocean Islands.

FRUIT AND VEG

Other key Mombasa industries include steel and iron processing plants, textile manufacturing, tropical fruit processing, salt works, glassworks and textile factories.

Tourism also plays an important part in and around Mombasa. There are hotels, inns, lodges and camps all over the area that encourage tourists to visit, hence creating a chain for several other small businesses to operate. Tourism is the major foreign exchange earner for Kenya.

OLD TOWN

Other local businesses include insurance companies and brokerage, wholesale and retail food distribution, distribution of sundries, hardware shops, garages, construction engineers as well as a wide range of professional services.

This is a fascinating old town, as rich in culture as it is in trade

JUST PRESS THE BUTTON

SUPER-HUB – the everything to everything data communication service. The *ultimate* data supermarket interfaced to *PSTN, ISDN,* fax, telex, *X.25, X.400* and, via IMC's Internet server SUPER-HUB.COM, the world of *Internet*. Available for *Inmarsat* A, B, M, Mini-M, and C.

Free software for *standalones* and *networks*. MAPI-compliant but including SUPER-HUB's fast connections, encryption, data compression and correction. *Language independent*. Ranges from full *MS Exchange*™ network gateway and standalone client through Windows 3.1 to DOS versions, all *fully compatible* with each other.

SUPER-HUB ELECTRONIC MAIL INFORMATION SERVICES OCEANSAT imc

Extra features include your own address on IMC's Internet server, *SUPER-HUB.COM*, the ability to use your fax machine as a *scanner* to *send images*, signed documents, etc.; and *OCEANSAT*, the point to multipoint *broadcast service* to receive news and weather or in-house broadcasts – with *no satellite time to pay*.

Now all *mobile units* using Inmarsat A, B, M, Mini-M or C, whether on *international* travel or a *remote* work site, are effectively addresses on the *office network* e-mail. Total *communication* for *everybody* in your organisation, including all e-mail, *fax* and *telex*, by simply using a *single, familiar platform*.

Information Management Consultants Ltd
Media House, Mann Island, Liverpool L3 1DQ, England
Tel: +44 (0)151 236 4124, Fax: +44 (0)151 236 9907
e-mail: IMC@super-hub.com, Web: http://www.super-hub.com

Problem...

All ISDN terminals have one of these

Yet all Inmarsat HSD terminals have one of these

Solution...

Many attractive low-cost ISDN products, like those shown, are supplied with an ISDN S-Bus interface, whereas most satellite communications equipment requires a serial interface. To overcome this problem, 7E has developed the SØDA, which provides your satcom with an ISDN interface.

The SØDA allows the complete Video Conferencing, PC Interconnect and Internet access pack shown to be supplied for less than $6000.

Prices correct at time of going to press

7E Communications

7E Communications Ltd.**, Swan House, 203 Swan Road, Feltham, Middlesex, TW13 6LL.* ***Tel: 0181 744 8500 *Fax: 0181 744 8501*

HOTLINE: 0870 514 3162

SALES, HIRE, SERVICE & CONSULTANCY

RIGHT ON TRACK

VEHICLE TRACKING HAS HIT THE WEB, ALLOWING BUSINESSES THE OPPORTUNITY TO FOLLOW THE PROGRESS OF THEIR CARGO WHEREVER THEY ARE, WRITES *PATRICK HOOK*

THE WALL-MOUNTED SCREEN in the company boardroom glowed in the background as the meeting droned on. On it could be seen the current position of some 60 or so freight liners making their way through the oceans of the world. For the men seated around the table, the information on the electronic chart was of crucial importance as they discussed the progress of the different vessels *en route* to their ports of destination.

Meanwhile, several thousand kilometres away, one of the company's shipping agents was also looking at the same information on his desk-mounted PC. Studying his secure website, he was observing the speed, bearing and exact location of the vessel that he was expecting before typing a brief message for the captain. Seconds later the message had been delivered to a shipboard screen via the satellite link.

ORDER BY E-MAIL

Meanwhile, once more, 300km up-country, in a car assembly plant, the production manager was looking, with some relief, at the same webpage. The ship's hold was full of engine parts destined for his plant and, using a password provided to him by the shipping company, he was now able to finalize the delivery arrangements with an on-screen e-mail to the shipping agent.

The ability to track and communicate with vessels, of course, is nothing new as a concept. What is new is that service providers are now beginning to offer tracking and communications functionality through the Internet. Whereas before tracking information was only available to those connected via LAN to the communications link, often at high cost, access is now available to anyone, anywhere in the world, at minimal cost.

MONITOR BY WEB

For the first time, fleet managers, board members, commodity brokers, customers and others with a legitimate interest in the movement of a package can be given password-controlled access to a webpage so as to track, almost instantly, the movement of a particular ship or vehicle. The service, launched in January 1998 by US service provider Comsat and quickly followed in February by their land earth station (LES) partners, France Telecom, is now being taken up by others around the world. Companies like BT and Pole Star Applications in the UK and Simac in the Netherlands have already launched or are about to launch Web-based tracking and messaging services for their customers too.

CUSTOM WEBPAGES

In principle all the systems work in the same way and require only that the user has access to the Internet and, at the vehicle/vessel end, a mobile data terminal and GPS receiver. Access to the service provider's webpage is through a normal URL address code where the user is prompted to provide a password. If that is correctly given, the user is presented with a customized webpage offering a range of options which vary according to his status within the customer's organization. Typically a fleet manager might be given full access to the tracking and messaging facilities and be allowed to reconfigure the intervals at which vehicles/vessels report their location. Boardroom directors may not need full access but may need to know the position of all vessels, while a client would only be given access to the location details of 'his' or 'her' ship or vehicle.

Before, tracking information was only available to those connected via LAN to the communications link, often at high cost

"We offer a 'standard' service that meets the needs of most of our clients," said Darrel Sheinman, managing director of Pole Star Applications, whose Freightfinder and Freightfinder Plus applications were launched in June last year. "The standard Freightfinder package shows the longitude and latitude of a vessel, its bearing and speed, at predetermined intervals throughout the day. It's a simple matter to alter the reporting times or poll the ship and obtain an immediate update.

"Normally shipping lines like to receive location data twice every 24 hours when the ship is in mid-ocean, and perhaps every 15 minutes for the last 10km of its journey. Messages go directly to the addressee and not via an Internet service provider, potentially saving anything from 10 minutes to several hours."

An upgraded Freightfinder Plus service gives customers the opportunity of setting out the parameters of the information they need from their vessels.

The functionality is similar to the Comsat and BT systems and at the request of the customer, allows information on temperature of the hold, pitch and roll, and so on, to be added to the standard speed, bearing and location data.

COST EFFECTIVE

Although Freightfinder and Freightfinder Plus concentrate currently only on the maritime market, Web-based land mobile systems are now being offered by Comsat, France Telecom and BT. For the first time, the smaller haulage companies can begin to think in terms of a cost-effective means of fleet management that narrows the competitive advantage previously enjoyed by their larger rivals.

Also about to join the market is the Dutch electronics company Simac, which is in the process of designing a Web-based vehicle fleet management system that will make use of Inmarsat-C to ensure connectivity with drivers throughout Europe.

A new era for fleet management and vehicle tracking has arrived

PHOTOGRAPH: TONY STONE

TALKING

THE LATEST PRODUCTS AND SERVICES VIA INMARSAT

TELSTRA LINK UP

In the first deal of its kind in the world, two arms of Australian service provider Telstra are linking up to offer free access to the Internet across the full range of Inmarsat services.

■ Telstra's Global Satellite and Big Pond, Australia's leading Internet carrier, have joined forces to deliver the full resources of the Internet to all its Inmarsat customers – including web-browsing, intranet and e-mail – as part of the normal tariff.
Michael Smith, head of Telstra Global Satellite, which markets Inmarsat services under the Satcom and MiniSat brands, said: "We can now give our customers the power of the internet from virtually anywhere on earth, including via ISDN. Global Satellite's customers are already heavy users of platforms delivering voice, fax and data at speeds up to 64kbps and higher.

■ "Connecting to Big Pond at these speeds will allow businesses to get on-line at the same speeds or better than they're used to at home."

■ Mr Smith said that, while hand-held satellite phone companies were heavily promoting access to voice communications in remote areas, it was important to remember that hand-helds don't yet offer useful data speeds for web-browsing and many other data applications.

PHOTOGRAPH: IMAGE BANK

FLYING THE FLAG: Australia's Big Pond leads the way

■ "The ability to get on-line in the middle of nowhere to check weather forecasts, order supplies, access news services or download a newspaper is something else altogether.

■ "Smart shipping operators, for example, recognize the benefits of having computers on board linked to their satcoms. The availability of up-to-the minute information via satcoms can deliver significant cost savings, avoid time wasting and contribute directly to staff morale."

CONTACT

Telstra on
Tel: +61 7 5490 9090
Fax: +61 7 5490 9094

REACHING OUT ACROSS CHINA

A subsidiary of Cable and Wireless has acquired rights to sell Inmarsat services to customers doing business in China. HKT has been appointed by Inmarsat's Chinese signatory, Beijing Marine Communications and Navigation Company, as its agent to market a full range of Inmarsat land mobile services – Inmarsat-A, B, C, M and mini-M phone – to customers based outside mainland China, including to Hong Kong, Macau and Taiwan.
"China is a huge country with much of its territory lying beyond the reach of terrestrial communications or cellular mobile networks," said HKT's director of international market development, Joseph Ma.
"Based on sophisticated satellite technology, Inmarsat land mobile services can fill in the gap and address those highly mobile and on-demand communications needs in the less accessible parts of the country."

Tunnelling on the Net

A new low-cost communications concept, called Internet tunnelling, has been launched for Inmarsat maritime users by IMC, the Liverpool, UK, company that runs the Super-hub mobile data messaging service. With shipping companies increasingly installing their own shoreside messaging server linked directly to the Net, IMC is offering to couple its Super-hub gateway to this Internet connection rather than to a traditional dial-out modem.

As a result, the shipowner eliminates the cost of making international calls to the messaging hub. The data traffic tunnels through the Internet to the Super-hub, using the high integrity and security of the Super-hub protocols rather than the usual Internet messaging transfer protocols. Because the shipping company's Internet line is almost constantly open, the Super-hub behaves, according to IMC, as the shipping company's own virtual private hub. Messages sent to ships from individual workstations in the office are immediately posted to the ships' Super-hub mailboxes, while those from the ships are picked up whenever an office message is sent – and, just like a private hub, at regular intervals of 30 minutes or less.

Ships still access the Super-hub using the Inmarsat-A, B, M, or mini-M data services, and can send and receive telexes, faxes, X.400, and Internet messages, as well as download other information services as standard. Shoreside, IMC points out that Internet tunnelling can also be carried out over a dial-up connection to a local Internet service provider, without the need for a dedicated server or a leased line to the Net.

CONTACT IMC on:
Tel: +44 151 236 4124
Fax: +44 151 236 9907

SHOP

PHOTOGRAPH: TONY STONE

● CONSERVATION MAKES CENTS: Care-calls help protect Africa's wildlife

CARE STATION AFRICA

Tourists in Africa who use an Inmarsat mini-M phone on a special tariff from Station Africa will be helping to conserve the wildlife of the continent. Station Africa introduced the airtime package, called 'CARE for Wildlife', specifically for the tourism and safari industries. Every minute of air-time used will see US$5 cents donated to CARE (Communication in Africa for Rare and Endangered species). The scheme subsidizes vital communications for the teams working to save animals on the endangered species list. A subscriber using 100 minutes will subsidize US$5 of airtime for one of the CARE project teams. Station Africa is setting up a website to help promote the scheme and has also run a competition with a mini-M phone as the star prize.

SURF TO **www.stationafrica.com**

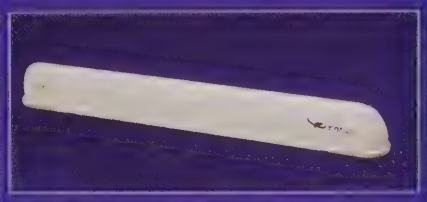
New payphone cuts the cost of calling

A new Inmarsat mini-M payphone from Applied Satellite Technology (AST) offers pre-paid international calls at highly competitive rates and comes in three versions for maritime, land mobile and fixed applications. Known as the Pay-satphone, the new phone was launched at the World Travel Market in London in November, and sells for less than US$6,600. It uses pre-paid debit cards, which provide global calling from about US$1.60 a minute. "As an Inmarsat accounting authority and service provider, we are able to offer a very competitive rate," said Chris Wood, international sales manager.

The Pay-satphone uses AST's GMP-2000 large antenna mini-M phone, and is available in three versions: a fixed land version for rural and remote applications, a marine version for cruise ships or crew calling, and a land-mobile version which can be used on trains or other vehicles. Three years ago AST was the first company to release a satellite payphone to work over Inmarsat, using the Inmarsat-M service and offering tariff rates of about US$4 a minute.

CONTACT Chris Wood on
Tel: +44 181 781 1844
E-mail: astlondon@aol.com

IN BRIEF



CAL LAUNCH ANTENNA

CAL Corporation has launched a new electronically steered phased array intermediate gain Aero-I antenna, the AMT-30, which with two extra antenna elements can out-perform its rivals, the company claims.

The AMT-30 is the latest addition to CAL's satcom range, which also includes the AMT-50 Inmarsat Aero-H antenna system. The company is currently working with airframe manufacturers to enable future customers to purchase the AMT-30 as a factory option. "CAL's AMT-50 presently dominates the larger corporate jet market and we expect to see the same in the smaller business aircraft market with the AMT-30," said Brad Smith, CAL's director of satcom products.

CONTACT **CAL on**
Tel: +1 613 727 1771
Fax: +1 613 727 1200

NEW MAIL 65

Singapore Telecom has launched a new version of its highly successful Mail 65 e-mail service aimed primarily at the shipping community. Inmarsat users anywhere in the world can access Mail 65 via a PC or laptop. The new service supports a range of messaging tools, including MS Mail, cc:Mail, Lotus Notes Mail, MS Exchange, Internet mail, X.400, fax and telex. The new package also includes a 24-hour, seven-days-a-week helpline, set up in Singapore to assist users wherever they may be in the world.

Mail 65 allows e-mails to be sent via Inmarsat-A, B, M and the MPlus mini-M phone, with no restriction on the type of terminal used, all with the same e-mail ID. It also offers bi-directional message transfer and compression of around 80 per cent of the original message.

CONTACT **Sentosa**
Tel: +65 481 6231, Fax: +65 481 8050

IN BRIEF

DISTRESS BEACON

A new lightweight Inmarsat-E distress beacon was launched by Navtec at the SMM International Maritime Exhibition in Hamburg, Germany. The emergency position indicating radio beacon (EPIRB) weighs less than a kilogram and comes with a price tag of about US$1,230. The time taken for transmission of a distress alert from an EPIRB via an Inmarsat satellite to receipt at the maritime rescue co-ordination centre is typically under two minutes.

CONTACT Navtec on
Tel: +49 30 60 91 82 22
Fax: +49 30 60 91 82 23
or e-mail: navtec@t-online.de

HYBRID MINI-M

A hybrid Inmarsat mini-M that automatically transforms itself from a vehicle-phone into a maritime or hand-portable satphone simply by connecting a different antenna has been launched by O'Gara Satellite Networks.

The O'Gara range of Worldfones – based on the Nera mini-M series – uses the innovative multiple ID format, which can save considerable money and offers a practical solution to anyone communicating on a boat, in a vehicle or from a portable phone.

When plugged in, the antennas for the phones – the portable Worldfone, Worldfone Marine and Worldfone Voyager – are identified by software running in the phone itself. The former doubles as a protective case and the entire unit weighs just 2.4kg. The Marine and Voyager antennas are fixed on top of the boat or vehicle, while the handsets are placed where convenient below.

CONTACT O'Gara
Tel: +44 1722 410800
Fax: +44 1722 410777

RUGGEDIZED LIBERATOR

Nera has released a new ruggedized version of its mini-M WorldPhone, the Liberator, designed to provide dependable communications under even the toughest conditions.

The WorldPhone Liberator is designed to be mounted out of sight and for calls to be made using only the handset. The aluminium casing makes it suitable for use in the harshest circumstances – in all-terrain vehicles, boats and planes – or exposed to extremes of climate and temperature.

The compact, durable phone weighs just 0.9kg and can be used as a fixed or semi-permanent installation, mounted on a vehicle dashboard, hidden under a seat, or stored below deck on a boat. The Liberator can even be set up to operate as a payphone.

As well as making ordinary phone calls almost anywhere in the world, it is possible to send and receive faxes, data, scanned images and e-mail through the handset or Nera's VT100 PC interface, which offers quick and easy access to functions such as speed-dial, 99-number memory and password security.

ILLUSTRATION: KEVIN O' BRIEN

CONTACT Nera on
Tel: +47 67 24 47 00
Fax: +47 67 24 46 21

INTRODUCING... STRATOS MAIL

Stratos Mobile Networks has introduced Stratos Mail, an innovative new messaging service that allows Inmarsat-A/B telex or Inmarsat-C equipped vessels to communicate directly via satellite with Internet e-mail subscribers around the globe.

- **Stratos Mail requires no additional hardware or software and provides seamless integration between shipboard Inmarsat-A/B telex and Inmarsat-C terminals. On board ship, messages are created and received on standard telex or Inmarsat-C equipment.**
- **On shore, registered customers use their Internet e-mail software or service to communicate with Inmarsat-A/B or Inmarsat-C users anywhere in the world.**
- **Stratos Mail offers cost-effective message delivery in both directions, as the Internet replaces traditional land-based telephone links and their associated costs.**
- **Further savings are available from the vessel in the form of free multiple delivery – or carbon copies – of individual messages to Internet e-mail addresses on shore.**

- **"Stratos Mail provides a bridge between two of the most important telecommunications technologies in the maritime industry," said Nils Helle, Stratos' vice-president of service development.**

CONTACT Stratos on
Tel: +1 613 230 4544
Fax: +1 613 230 4212

IMPROVED SHIPBOARD MESSAGING

Rydex, the maritime wireless e-mail and data communications company, has launched a new generation of shipboard messaging software, RMS Exchange, which integrates with industry-standard Microsoft messaging programs such as MS Outlook and Exchange.

RMS Exchange uses Rydex's specially designed protocols and compression techniques to increase throughput and reduce transmission costs over the Inmarsat system, while letting shipboard personnel work in a sophisticated and familiar messaging package that can be closely linked with other Windows programs.

The Canada-based company operates three public messaging hubs in Vancouver, Tokyo and Hamburg, and its ship-shore e-mail software is installed on about 700 vessels world-wide. Further developments expected from Rydex in the near future include the launch of an Internet tunnelling service and an MS Exchange server gateway package.

The latter will extend the full message tracking capabilities of Outlook to the shore-based Exchange Server system, giving corporate users the same level of sophistication as their shipboard counterparts who use RMS Exchange. Internet tunnelling will allow Rydex Mail Manager hubs to connect directly – and hence more cheaply – over the Internet, doing away with the need for expensive international calls.

CONTACT Rydex on
Tel: +1 604 279 3400
Fax: +1 604 279 3456

ON THE BRIDGE: RMS Exchange integrates with industry-standard software

JOINT VENTURE CREATES SUPER-HUB CONNECTION

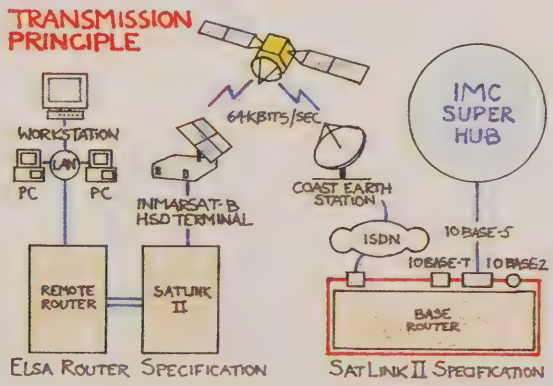
■ IMC has teamed up with the British company Livewire to connect Inmarsat-B high-speed data (HSD) users to its Super-hub data messaging service.

■ The joint venture, between Liverpool-based IMC, which runs the Super-hub mainly for Inmarsat's maritime users, and Livewire, arguably the market leader in HSD hardware, provides a solution that enables Inmarsat-B HSD terminals to transmit data at 64kpbs between computers.

■ Normally, only a serial cable is required between computer and terminal to transmit data at the standard speed of 9.6kbps. But Inmarsat-B HSD, which uses synchronous rather than the asynchronous technology of its counterpart, calls for special connecting units to be in place at both the transmitting and receiving ends. *

■ IMC is offering to configure and install Livewire's SatLink II hardware with customers' Inmarsat-B HSD terminal so that any version of IMC's Super-hub software will communicate in the usual way with IMC's messaging centre.

■ At the Super-hub end of the link, IMC has special HSD ports. Once connected to the Super-hub, the HSD user can do all of the things any other Super-hub user can do, such as Internet mailing, sending faxes, and telex and X.400 messaging – all at high speed and with virtually no 'handshake' time. Inmarsat-B high-speed data is six-times faster than the standard rate, yet is only twice the cost per minute.



*** In synchronous transmission, the sending and receiving equipment are kept in step by timing signals, which eliminate the need for the start and stop bits used in asynchronous transmission and which significantly increase data throughput rates.**

The Livewire SatLink II terminal interface and mobile router hardware, coupled to an Inmarsat-B HSD terminal, gives ISDN-speed links for the transfer of all kinds of data files and messages.

CONTACT

IMC on
Tel: +44 151 236 4124
Fax: +44 151 236 9907

CONTACT

Livewire on
Tel: +44 1372 731400
Fax: +44 1372 731420

PHOTOGRAPH: TONY STONE ILLUSTRATION: HARRY RICHARDSON

High-resolution laptop

The technology behind the high-resolution TFT displays used for laptop portable computers has now found its way into the latest Inmarsat-C Global Maritime Distress and Safety System (GMDSS) equipment.

Thrane and Thrane, the Danish manufacturer, has integrated a 26.4-centimetre colour TFT screen as part of its TT-3606E message terminal, the centrepiece of the new system. The unit's built-in light sensor ensures optimal working conditions by day or night, and the system's compact design makes it simple to install even where space is limited.

The same technology has been adopted by the US company, Sea, for its new Sea 300-A3 GMDSS console, which includes MF/HF radio-telephone, Inmarsat-C and fixed VHF radio-telephones. The MF/HF and Inmarsat-C units, and support equipment such as the super-slim data terminals and printers, have been packaged into a compact and attractive table-top mounted enclosure.

CONTACT

Thrane and Thrane on
Tel: +45 39 55 88 00
Fax: +45 39 55 88 88

CONTACT

Sea on
Tel: +1 425 771 2182
Fax: + 1 425 771 2650

TOP OF THE RANGE: Thrane and Thrane's new high-resolution TFT display (top) and the new Sea console (left)

TURBO-CHARGED FAXES

People who need to send faxes from far-away places can now transmit documents from the middle of nowhere and make considerable cost savings thanks to a new package being bundled with the Nera WorldPhone mini-M.

The WorldPhone TurboFax package consists of a Nera WorldPhone, TurboFax software, a Canon portable scanner/printer and cables.

The system works by linking the WorldPhone to a PC or laptop. The scanner enters the document into the computer, which then uses the mini-M to connect to the chosen destination. Meanwhile, Turbofax compresses the fax information to speed up delivery time over the Inmarsat satellites, typically reducing transmission time by half, with some faxes going up to 75 per cent faster.

Time is also saved by entering the document on to the computer. Because it is already formatted ready to send, there is no opportunity for handling errors, including documents not feeding properly or two pages passing through at once. The computer then retains the records for future use, either to be printed off, e-mailed, faxed again or stored.

Other benefits include:

- Transmission to any fax machine in the world, including mini-M to mini-M
- Streamlining of all the standard fax protocols, automatically saving 10 per cent on airtime alone
- Savings of over US$9,000 a year if you send only one fax per day
- Direct paperless mini-M to mini-M messaging facility, arriving just like an e-mail
- Fully editable Security encryption for messages and faxes, with password protection for shared PC and multiple users

- Ability to send colour images and other data files from mini-M to mini-M, or to any fax machine
- Standard batteries mean the TurboFax scanner/printer can operate without an external power supply.

CONTACT Nera UK on
Tel: +44 1737 648800

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01 ☐ Yes **02** ☐ No **03** ☐ Under consideration

● WHAT TYPE OF SATCOMS DO YOU USE OR NEED?

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10 ☐ Government
11 Other (please state) _____

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06 ☐ Strategy/senior management
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THE GLOBAL PARTNERSHIP

INMARSAT is the International Mobile Satellite Organization. It is owned by 84 member countries and from its headquarters in London operates a constellation of geostationary satellites that make possible global mobile communication.

CALLS FROM AN INMARSAT SATPHONE are beamed up to one of the satellites positioned above four ocean regions – the Pacific, Indian, and Atlantic East and West. The satellite then routes the call down to one of nearly 40 land earth stations (LESs), also known as coast or ground earth stations, that act as gateways to the conventional, terrestrial phone system – and vice versa.

WITH INMARSAT it is possible to make not just voice phone calls, but also to send and receive faxes, telex messages, electronic mail, or computer files – even live video and broadcast-quality sound.

INMARSAT itself embraces a unique blend of competition and co-operation. Airtime on the network is sold by LES service providers, many of them from Inmarsat's 84 signatory owner-investors, who compete with each other for business. And, although the satphones for each Inmarsat service – Inmarsat-A, Inmarsat-B, etc – must be type-approved to Inmarsat specifications, they are made and sold by many of the world's leading electronics companies.

SERVICE PROVIDERS, manufacturers and equipment retailers are all members of the global Inmarsat Partnership.
Many use the Via Inmarsat mark to distinguish their products.

● Full details of where to buy or rent an Inmarsat satphone around the globe are available on the World-Wide Web.

The address is: www.inmarsat.org/suppliers
Or contact: Inmarsat Customer Services,
99 City Road, London EC1Y 1AX,
United Kingdom.
Tel: +44 171 728 1777
Fax: +44 171 728 1746

INMARSAT SYSTEMS GUIDE

INMARSAT MINI-M
Designed to exploit the spotbeam power of the Inmarsat-3 satellites, the latest Inmarsat mini-M phones are the smallest, lightest and cheapest ever made. Weighing about 2kg and the size of a notebook computer, prices range from US$3,000 for the phone and US$3 a minute air-time. Maritime, land, vehicular and semi-fixed versions are available.

INMARSAT-A
The original service introduced in 1982, providing direct-dial telephone, fax, data, telex and e-mail.

INMARSAT-B
Introduced in 1993, this is the digital successor to Inmarsat-A. It offers services similar to those of Inmarsat-A, but with significant reductions in call costs due to its more efficient use of satellite capacity.

INMARSAT-C
The first true personal satellite communications service and one of the most popular. It enables data messaging (but not voice calls) using small, relatively inexpensive portable terminals. A modified aeronautical version is also available.

INMARSAT-D+
Inmarsat D+ offers global two-way data communications using terminals no bigger than a personal CD player.
Complete with integrated GPS, D+ systems are ideally suited for tracking, tracing, short data messaging, and supervisory control and data acquisition (SCADA) applications. Inmarsat-D offers a one-way messaging service.

INMARSAT-E
Provides global maritime distress alerting services transmitted from emergency position indicating radio beacons (epirbs) and relayed through Inmarsat coast earth stations. Covers virtually all of the world's ocean areas and is fully compliant with the Global Maritime Distress and Safety System (GMDSS).

INMARSAT-M
The world's first personal, portable mobile satellite phone introduced in 1993, making possible telephone, group 3 fax, data and group call services from a briefcase-sized terminal. Also available in maritime versions with radome antennas as small as 70cm in diameter.

AERO-C
A low-cost messaging and data reporting service providing aircraft with store-and-forward satcoms. Ideal for aircraft flying in regions where radio communication is difficult or impossible. In addition to its proven position reporting facility, Aero-C can be used for weather and flight plan updates, maintenance and fuel requests, and business and personal communications.

AERO-H
Introduced in 1990, offering telephone, fax and data communications in aircraft passenger cabins and cockpits.
It is also used for airline operations and in air traffic control.

AERO-I
An intermediate-gain telephone, fax and data service for short and medium-haul aircraft that operates within the Inmarsat-3 spotbeams and makes possible a new generation of smaller, lighter and cheaper avionics and antennas.

AERO-L
A low-gain aeronautical satcom service offering real-time, two-way air to ground data exchange at 600 bps. Complies with International Civil Aviation Organization (ICAO) requirements for safety and air traffic control.

PHOTOGRAPHS: TONY STONE

ON YOUR BIKE: Pedalling past the monasteries and paddy fields of southern China

IN CONVOY

Andrew Thomas **is deputy managing director of the *International Herald Tribune.* Last year he travelled to Kunming in the heart of southern China to join a unique international expedition called the Thailand-Laos-China Friendship Caravan**

I CROSSED THE FINAL HALF-KILOMETRE of "no man's land" between China and Laos. In the company of 25 other vehicles, and escorted by the Chinese police, I had driven my way from Kunming through southern China to the Laos border. Proud of my achievement, I pulled out my satphone to call my mother. Babbling with excitement and pleasure at the beauty I had seen, I tell her where I've reached.

"That's very nice, dear," came the reply. "Anyway, how are the children?"

An odd reply, perhaps, but then she had no idea what I had just experienced. Southern China does have to be seen to be believed, and few Americans, or indeed any other nationalities, take the time to see it. My opportunity to take this mammoth journey came about through the Tourism Authority of Thailand, who are trying to raise the region's profile as a top travel destination. The authority invited me, along with the other participants, to form a caravan driving 1,300km through the upper region of the Mekong River Basin, from China to Thailand. On route, I used an Inmarsat mini-M phone, supplied by Nera. SingTel supported the expedition through their Sentosa land earth station.

COLOURFUL KUNMING

I'll never forget day one. At a height of 1,880 metres, Kunming's climate is bracing in the winter months. The city, with its population of 3.5 million, was full of contrast and colour. Its wide, tree-lined streets teemed with cyclists pushing down the boulevards like great schools of fish. Big department stores with large windows are well stocked with modern goods. Across town on the Flower and Bird market, cobblestone lanes meander through rows of shops selling birds, seeds, flowers and frogs. The main temple was an extraordinary panoply of thousands of Buddhist statues. I remember, somewhere, a prayer bell sounded as Chinese opera music wafted from an open window somewhere in the distance.

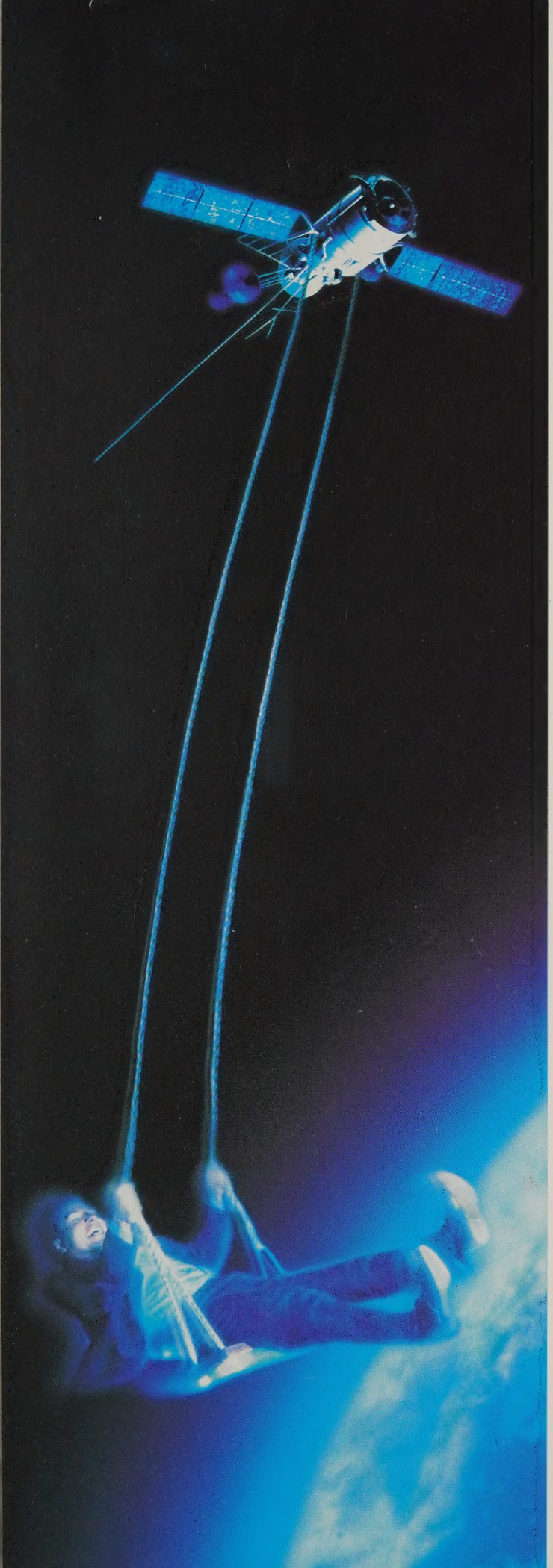
We kicked off at dawn on the second day and our convoy of 25 vehicles hit the streets of Kunming behind a police escort. Then our journey began in earnest with a straight run towards Laos.

SPECTACULAR COUNTRY

Over six days in January the other expedition members and I navigated our way over hundreds of kilometres of highways and four-wheel-drive tracks in the upper region of the of the Mekong River Basin. We passed through some of Asia's most spectacular country across tropical rain forests and chilly highlands.

It was a fabulous trip, and wonderful to be able to relay the details home by phone

> SOUTHERN CHINA DOES HAVE TO BE SEEN TO BE BELIEVED, AND FEW AMERICANS, OR INDEED OTHER NATIONALITIES, TAKE THE TIME TO SEE IT



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